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3D WORLD

HE ONLY MAGAZINE FOR 3D ARTISTS

dynamic liquids

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PERFECT TIMING

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NALYSIS

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LUE SKY – FROM ICE AGE TO ROBOTS
IPS FOR BETTER STORYBOARDS
IN A £1,850 HP WORKSTATION

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COVER ARTIST

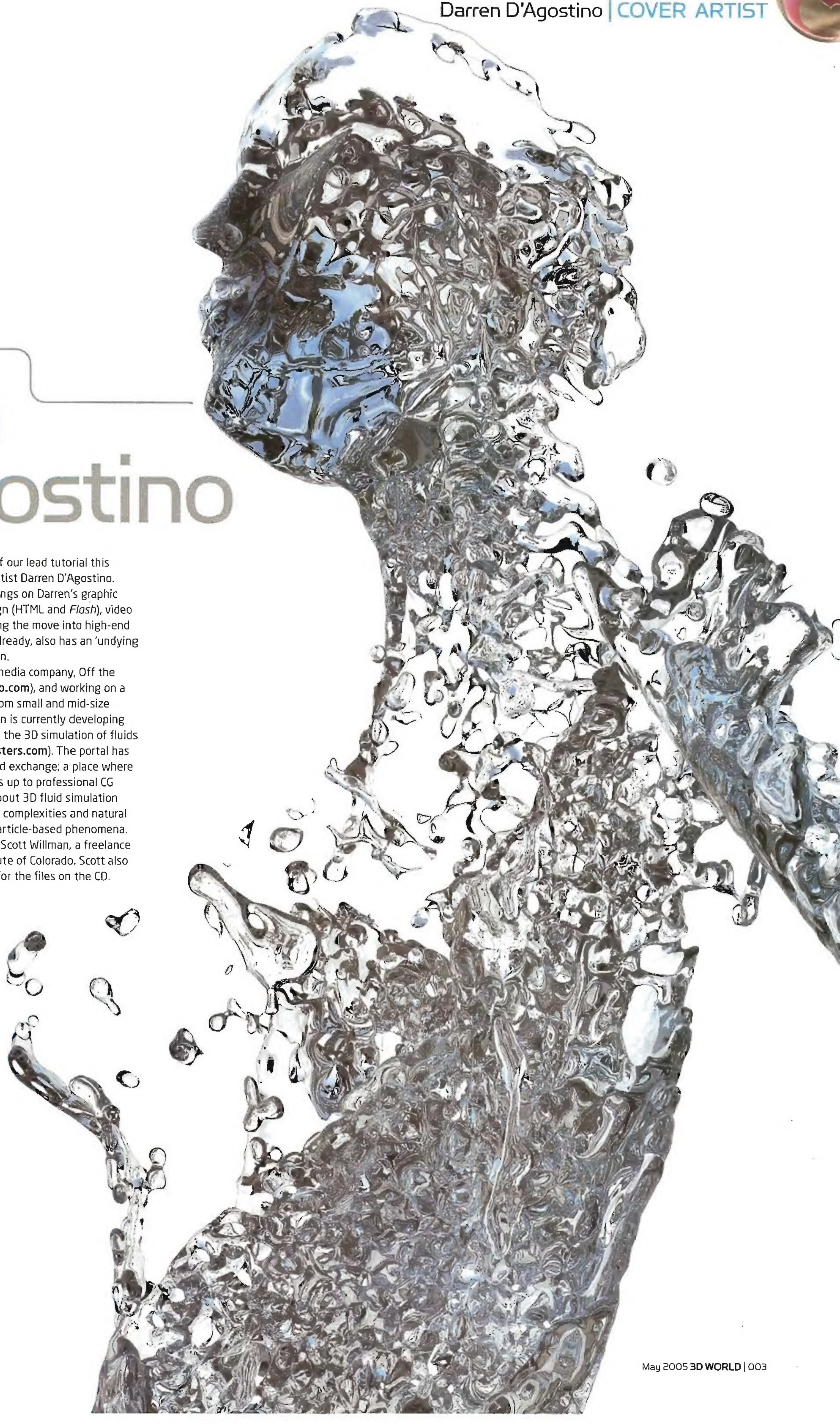
Darren D'Agostino

OUR COVER ARTIST, and the writer of our lead tutorial this issue, is New York-based 2D and 3D artist Darren D'Agostino. A renowned 2D design expert, the strings on Darren's graphic arts bow include print work, web design (HTML and *Flash*), video editing and animation. He's now making the move into high-end 3D, and as if he wasn't busy enough already, also has an 'undying passion' for audio and music production.

As well as starting his own multimedia company, Off the Rack Productions (**www.offtherackpro.com**), and working on a range of projects for clients ranging from small and mid-size companies to large corporations, Darren is currently developing an online 3D community based around the 3D simulation of fluids called Liquid Masters (**www.liquidmasters.com**). The portal has been conceived as a kind of online fluid exchange; a place where anyone, from students and researchers up to professional CG artists, can exchange ideas and tips about 3D fluid simulation and related CG art, while exploring the complexities and natural marvels of fluid dynamics and other particle-based phenomena.

The cover image was rendered by Scott Willman, a freelance 3D artist and student at the Art Institute of Colorado. Scott also contributed some MEL scripting work for the files on the CD.

[w] www.offtherackpro.com



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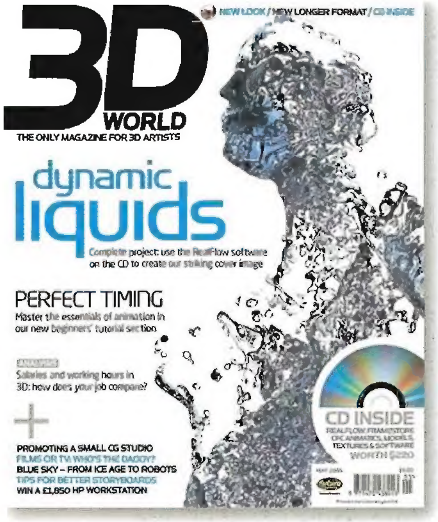
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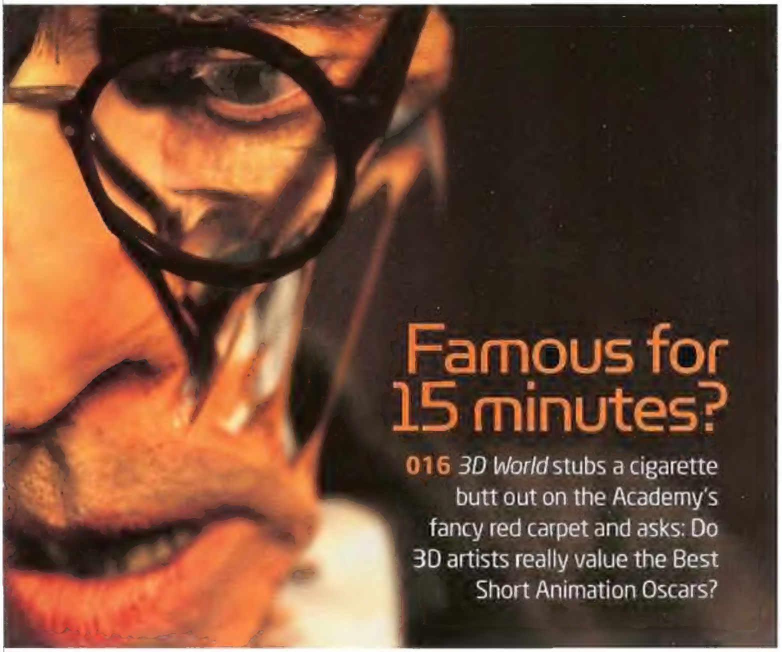
REALFLOW, FRAMESTORE CFC ANIMATICS, MODELS, TEXTURES & SOFTWARE
WORTH $220

dynamic liquids

042 Load up the evaluation version of *RealFlow 3* from this issue's CD, then follow this in-depth tutorial to recreate the aqueous artwork on our cover



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ON THE CD

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3D WORLD advisory board

3D World is brought to you with the help and advice of leading 3D industry figures

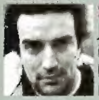
SHELLEY PAGE

European Representative, DreamWorks Animation

Shelley Page started her career in feature animation as Backgrounds Supervisor on Disney's *Who Framed Roger Rabbit?*. She was one of the first artists hired to form DreamWorks Animation in 1995. She is now DreamWorks' European Representative resourcing new talent for the studio.

www.dreamworks.com

JORDI BARES



Senior 3D Animator, The Mill

Jordi Bares worked for eight years in the games and film industries his native Spain, before moving to London in 2000, where he has also freelanced at Jim Henson's Creature Shop and Passion Pictures. The winner of many awards, he was nominated for an Emmy for his work on the BBC documentary *Pyramid.*

www.mill.co.uk

ANDREW DAFFY

CGI Supervisor, House of Curves

Andrew Daffy has worked in the CGI industry for ten years on projects that have accumulated over 30 awards. He was recently named one of Alias's *Maya* Masters for 2004. His new company, The House of Curves, will act as both a studio and a training school.

www.thehouseofcurves.com

ALEX MORRIS

Director, Hayes Davidson

Alex Morris qualified as an architect in 1990 and joined architectural visualisation agency Hayes Davidson in 1996, having completed over 40 buildings across a number of sectors. He is responsible for many of HD's landmark images, including the UK's Millennium Dome, and the Tate Modern art gallery.

www.hayesdavidson.com

JOLYON WEBB

Principal Artist, Codemasters Software Company

Jolyon Webb moved into developing game art after years as a freelance illustrator. He works at leading videogame studio Codemasters as Principal Artist in the Central Technology Group: the company's internal research and development team.

www.codemasters.co.uk

AARDMAN ANIMATIONS

Scott Pleydell-Pearce, Bobby Proctor and Stefan Marjoram

Respectively CGI Animation Head of Department, CGI Lighting/Technical Head of Department and a Creative Director for the commercials department, Scott, Bobby and Stefan have over 20 years' combined experience at Aardman, working on a range of award-winning ads, idents and short films.

www.aardman.com

Editor's perspective

Over the course of a working week, I have to put in a number of calls to senior people in the 3D industry: VFX Supervisors, Heads of Department, Lead Artists, and the like. In my early days on the magazine, I would make these calls during normal working hours. My enquiries were usually met in a polite, but slightly distracted, manner, which suggested that the client was on the other line, the junior animator was currently performing a worryingly freeform interpretation of the job in question, and could we please keep this brief?

Later, I learned that that a better time to place these calls was after 8pm at night. Not because I was in a different time zone to the people I was trying to call, but because that was when they had most time to talk - and, significantly, because I could always find them in the office. This taught me two things: one, that I was about to become a whole lot better acquainted with our night security guard, and two, that in this industry, there are no such things as 'normal' working hours.

So should I have been surprised? 3D is, after all, a creative occupation, and one in which people take pride in their work. Surely long hours are simply a reflection of the personal responsibility people are prepared to take for a project? Well, yes. But it also strikes me that long hours are also a symptom of a young industry. It's far easier to accept another early start, a third consecutive all-nighter, if you have no precedent for not doing so. Unless you have evidence to suggest that other people doing similar jobs do so without working 18-hour shifts, you are condemned to continue to put them in.

Which is why we decided to put together our State of the Industry feature this issue. We polled 3D professionals on three key topics - working hours, rates of pay and job security - in an attempt to uncover just what constitutes 'normal' working conditions. You can read our complete findings in the article itself, which starts on page 32. But there is one striking point that emerges: while conditions vary randomly from studio to studio, they vary consistently from market sector to market sector. If you work in architectural visualisation, you probably put in fewer hours and have more job security than if you were to work in the games industry - and earn more money for the privilege.

In these days of converging technology and converging job skills, how long can such a situation be sustainable? After all, both architects and games artists create detailed near-photorealistic environments, and many of them do so with exactly the same software. So how long will it be before equality of responsibility translates into equality of working conditions?

As a recent spate of legal cases indicates, 3D artists are increasingly mindful of such issues. While legal action is a last resort, awareness of market conditions does at least offer an alternative solution: if you know that the grass is genuinely greener at another studio, you can go to work there. You may not be able to change the company you work for single-handedly. But at least you can vote with your feet.

JIM THACKER Editor
jim.thacker@futurenet.co.uk

LETTER OF THE MONTH

Many years back, I remember getting really excited at the arrival of 3D and digital effects. I had visions of visiting the cinema and being blown away by the seemingly limitless creations put before us by the rejuvenated film industry. But to my horror, the commercial film industry has followed exactly the same path as the music industry. We're constantly presented with either chart-loads of mediocrity or, worse still, remakes of tired old favourites.

Your feature in the March issue of *3D World* [on what artists working on the remakes of *King Kong*, *War of the Worlds* and *The Hitch-Hiker's Guide to the Galaxy* have drawn from the original movies] served to highlight this. I for one can't believe that the likes of Peter Jackson could only think of *King Kong* to follow up the awe-inspiring *Lord of the Rings* trilogy. Surely, with the huge financial success the trilogy has earned, he could have made anything he wanted to, comfortable in the knowledge that whatever he made would have put bums on seats.

The first remake I can recall was *Flash Gordon*. After having trekked to the Saturday morning matinees to see the original black-and-white versions, I couldn't wait to see this much-hyped film – but I was left feeling utterly disappointed, and I knew why: the remake failed to capture the original atmosphere, which was largely a result of the limitations of the crude special effects techniques available at the time.

However, I have no desire to pay good money to see any of the modern remakes mentioned in your article. Moreover, my young family had no interest in *Thunderbirds*, *The Magic Roundabout*, *Garfield*, *Scooby Doo*, *The Flintstones*, *Godzilla* – to mention a few recent examples. So what's happened to the promised feast of creativity? There must be original scripts out there: do they simply fail to get further than the film festivals?

KING KONG

Issue 62: should so much 3D talent be exp wwwended in remaking old

It could be argued that while filmmakers are making money out of these movies, they'll continue to produce them. Yes, visiting the cinema is a part of our culture and we may well keep visiting, no matter what's being shown. But has anyone considered how audiences would increase if there was something genuinely new and really worth watching?

It's time the directors emerged from their ivory towers in search of some original material. Let's have some new talent with fresh ideas that make the most of the wonderful technology we now have at our disposal.

Mark Lacey | Via email

Our article in issue 62 was intended to explore what modern 3D artists can learn from pre-digital effects work, in much the same vein as the Inspirations piece on *The Thief of Baghdad* [*3D World* 62, p. 111]. As for the upcoming films we covered, the jury is very much still out (although, secretly, aren't you slightly curious to find out what Mos Def is going to be like as Ford Prefect?) Until then, we hope that a copy of Timothy Albee's book on the making of his film *Kaze, Ghost Warrior* goes some way to proving that there's still original 3D work out there.

WRITE IN AND WIN...

Congratulations to **Mark Lacey**, who wins a copy of ***CGI Filmmaking: The Creation of Ghost Warrior*** by Timothy Albee, published by Wordware Publishing. Part 'art of' and part 'how to', the book explores how one artist can create feature-quality 22-minute animation in six months. We'll also throw in a DVD of the film itself, available via KURV studios. www.wordware.com, www.kurvstudios.com

Send us your feedback | 3dw.mailbox@futurenet.co.uk

ROY MEETS GIRL

> Congratulations on finding an bigoted idiot for a columnist in the shape of dear old Mental Roy and his comments on the Miss Digital World competition [Pre-viz, issue 62]. Granted, the quality of the entrants varied so much that whilst some were very good, some were a long way from that. But his comments about large-breasted women fighting dragons related to single entrant from the USA who used some of the project files from a games design he had recently produced. He might have done it over a hot computer in the middle of the night, but I somehow doubt it.

A rendered still produced by Miss Digital World entrant Steve Challice. Are digital beauty contests an excuse for the 'titty morph target' as Mental Roy argued, or simply more publicity for the 3D industry?

In many ways, the competition was good for the 3D world. Firstly, it generated interest in the mainstream British media (including Brighton's *Evening Argus* and London's *Metro* newspapers). Secondly, it gave a platform for people who would never get a chance to have 3D work published. While many of this year's entrants may have been so-so, this is the first year the competition has been in existence. Give it a few years and the quality of entrants will improve considerably.

The main problem with Mental Roy is that he's taken it all so seriously. Does the concept of Miss Digital World wanting world peace and kindness to furry animals not strike him as a bit funny? The whole competition was tongue in cheek, and if you can't see that, you must have had a humour bypass. So come on, Roy: get off you soap box and have a laugh with the rest of us.

I feel that I have the right to comment as I was the contest's only UK entrant. I worked hard on the project during my normal working day and all the girls I talked to thought it was hugely funny.

Steve Challice
www.digorigmodels.com

But surely Mental Roy's point was precisely that not all publicity is good publicity? If we, as 3D artists, want the general public to understand the breadth of the work we do, don't we have to question the ways in which the mainstream media represents 3D art? As for a sense of humour failure, we suspect that you'll find Roy's tongue is also to be found somewhere in his little rendered cheek – some of the time...

LESS HOW, MORE WHY

> I have a shelf groaning under the weight of copies of *3D World* – complete with every issue since the first one! But while I've found much useful advice in these pages, and can now talk with authority about HDRI, Global Illumination and Non-Uniform Rational B-Splines, I've noticed that there's one thing missing, particularly in the tutorials: the 'Why' information.

There is plenty of 'How': the details of how to achieve the objective of a tutorial. But if a caption says 'Set the Size to 3 with a Variation of 50 and set the Orientation to Allow Spinning', what effect do these settings have? What happens if I set the Variation to 300 instead? And what if I *don't* want to Allow Spinning?

I would appreciate a better understanding of the effects of adjusting parameters, even in the applications that I don't own. So why not have the occasional tutorial on a particular effect – such as the bow wave and wake of a ship – with a brief look at

Our dummy's guide to showreels from issue 60: while you may have several strings to your bow, it may be better to produce a demo reel tailored to a particular job, then list your other skills in an accompanying CV

how the parameters work in several different packages?

Dave Millett | Via email

Thanks for your feedback on the tutorials section. While the different ways in which 3D software packages are structured means that it can be difficult to make an exact like-for-like comparison, we will look into this idea for future issues.

WHAT'S IN A NAME?

I read your article 'Showreels... A Dummy's Guide' in issue 60, and found myself wondering: "So what do I advertise myself as?" In my current position, I work for a television station as a 'graphic designer'. However, I feel that this title undersells what I do. As with many designers, I have a multi-functional job, varying between live programming, print work, web design, editing, 2D and 3D animation. A major part of my work is done in *3ds max* and *combustion*, not to mention a score of other packages.

I'm a certified graphic designer, but I feel that my demo reel reflects me more as a 3D/2D artist. So what do I call myself when I send off my demo? I'm pretty sure 'graphic designer/animator/artist/internet artist/editor' is a bit too long... Any suggestions you might have would be greatly appreciated.

Steve Wishart | Via email

Rather than agonising over how to describe yourself in the covering letter, why not let your past work speak for you? One of the points that many of our interviewees made is that it's a good idea to create alternative versions of your demo reel, each tailored towards a particular job. When it comes to producing a CV, there's nothing to stop you listing your official job title, then adding a couple of sentences explaining in more detail what the role involves.

OUR NEW DESIGN: MORE THOUGHTS

Re: the new design of *3D World*. I must admit to worrying that it would be a mistake. I mean, I loved the magazine as it was, so I was worrying that you'd go down the wrong route, change the size and feel, and ultimately become dull and tired.

But no. The new format is superb, and (in my humble opinion) very tidy indeed. Of course, I guess I have a couple of gripes. I mean, I know we all want our 'own' software to get most exposure, but considering *Softimage|XSI* is now massively more accessible due to its new pricing structure, to donate only a third of a page to it in the Q&A section is surely a tad remiss?

All in all, though, it's a brilliant mag made better. Now if only *3D World* ever get round to selling binders, we might have the perfect combination...

Kev A | Via email

I just wanted to say how much I liked issue 62. I think the new format is very successful and the focus on the actual art behind the techniques is great. It's really good to see *3D World* maturing in this way.

Paul Franklin,
VFX Supervisor | Batman Begins

For the most part, I like your new look, but on page 28 of issue 62 [the Close Up article on the new Ford Mondeo ad], when I get to the Freeze Frame section at the bottom of the page, I have to complain loudly about the text orientation. I mean, c'mon: maybe it looks nice from a design point of view, but do I really have to hold the magazine sideways just to read this blurb? Guys, you're making me feel that I'm 16 again and that I'm looking at a copy of *Penthouse*...

Alex Dearden | Via email

Thanks again for all of your feedback on *3D World*'s new look. We'll be covering the major 3D software packages in different ways from month to month, so if your principal application only received a half-page Q&A in issue 62, this may mean it's scheduled for more extensive coverage. *Softimage|XSI* users, for example, should check out the four-page animation tutorial that starts on page 50. That particular tutorial series is aimed at new animators, but more advanced content will be along in future issues...

3D WORLD
dream machine
KING KONG
CD INSIDE

Our new design: stylish, or a nostalgic nod to the joys of 'reading' *Penthouse*?

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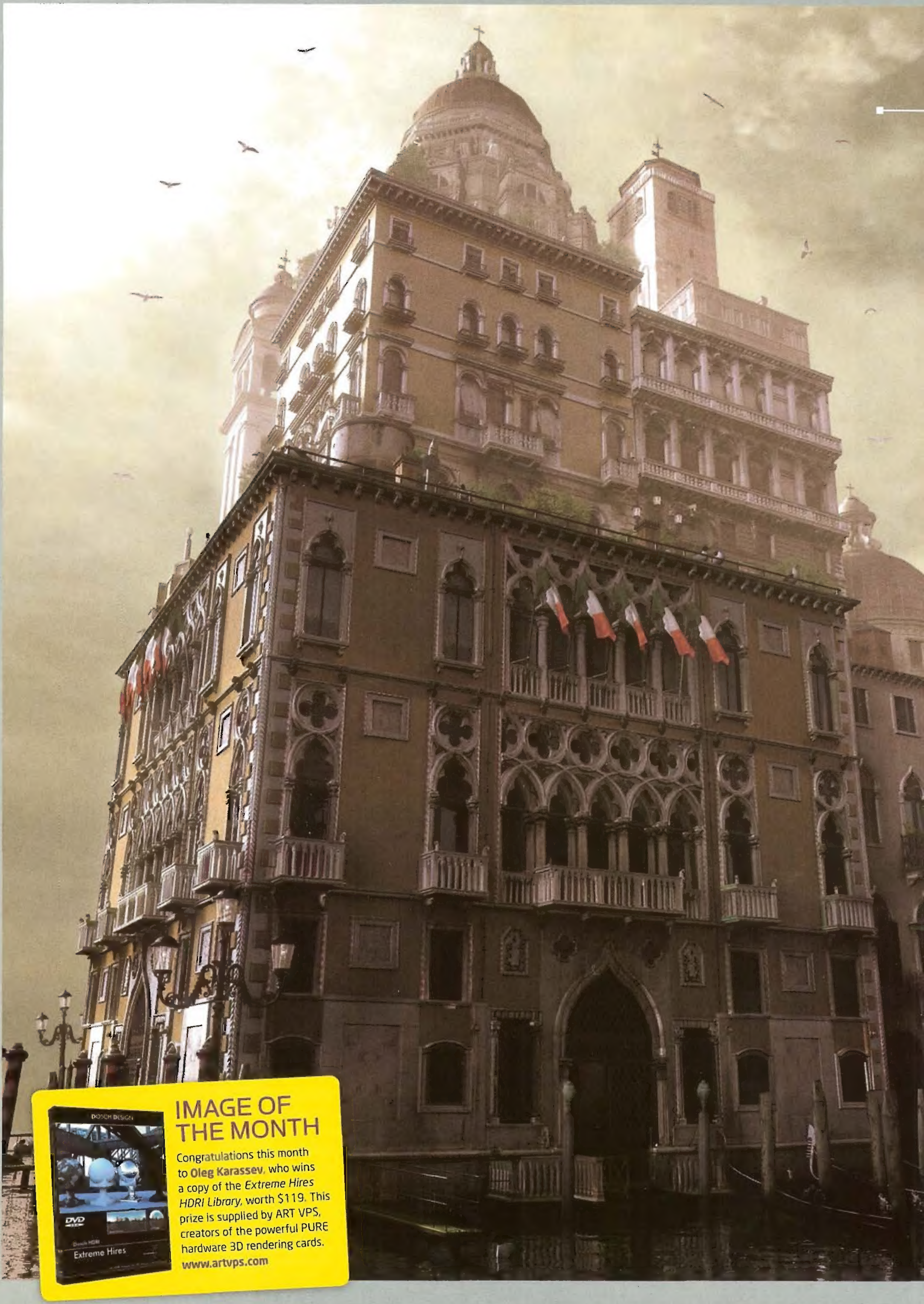

IMAGE OF THE MONTH

Congratulations this month to **Oleg Karassev**, who wins a copy of the *Extreme Hires HDRI Library*, worth $119. This prize is supplied by ART VPS, creators of the powerful PURE hardware 3D rendering cards. **www.artvps.com**

OLEG KARASSEV Venice
3ds max, Photoshop

"I'm 30 years old and I live in Russia, in the Moscow region. I began to learn 3D graphics in 1996 when I got a computer with good graphics hardware. I studied the basics of CG, and began working as a graphics artist. For some years I worked on CD-encyclopedias. Now I prefer to work on non-commercial 3D projects - it's a way to express myself."

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WEI WEI HUA The Harbor
3ds max, V-Ray, Photoshop

"I'm 28 years old. I'm from China and I'm currently working in Paris. I'm interested in fantasy art, and I love to design everything from buildings, props, spaceships and cars to creatures, costumes and film characters. First I draw a schematic on paper, then I use *3ds max* to make the model and render using *V-Ray*. I create the textural details and compose the image in *Photoshop*."

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CHUCK GRIEB Whoops
Maya, Photoshop

"I've worked in the Los Angeles animation industry for a number of years, for studios such as Disney and Cornerstone. Currently I'm a faculty member at California State University, Fullerton, teaching traditional and digital animation."

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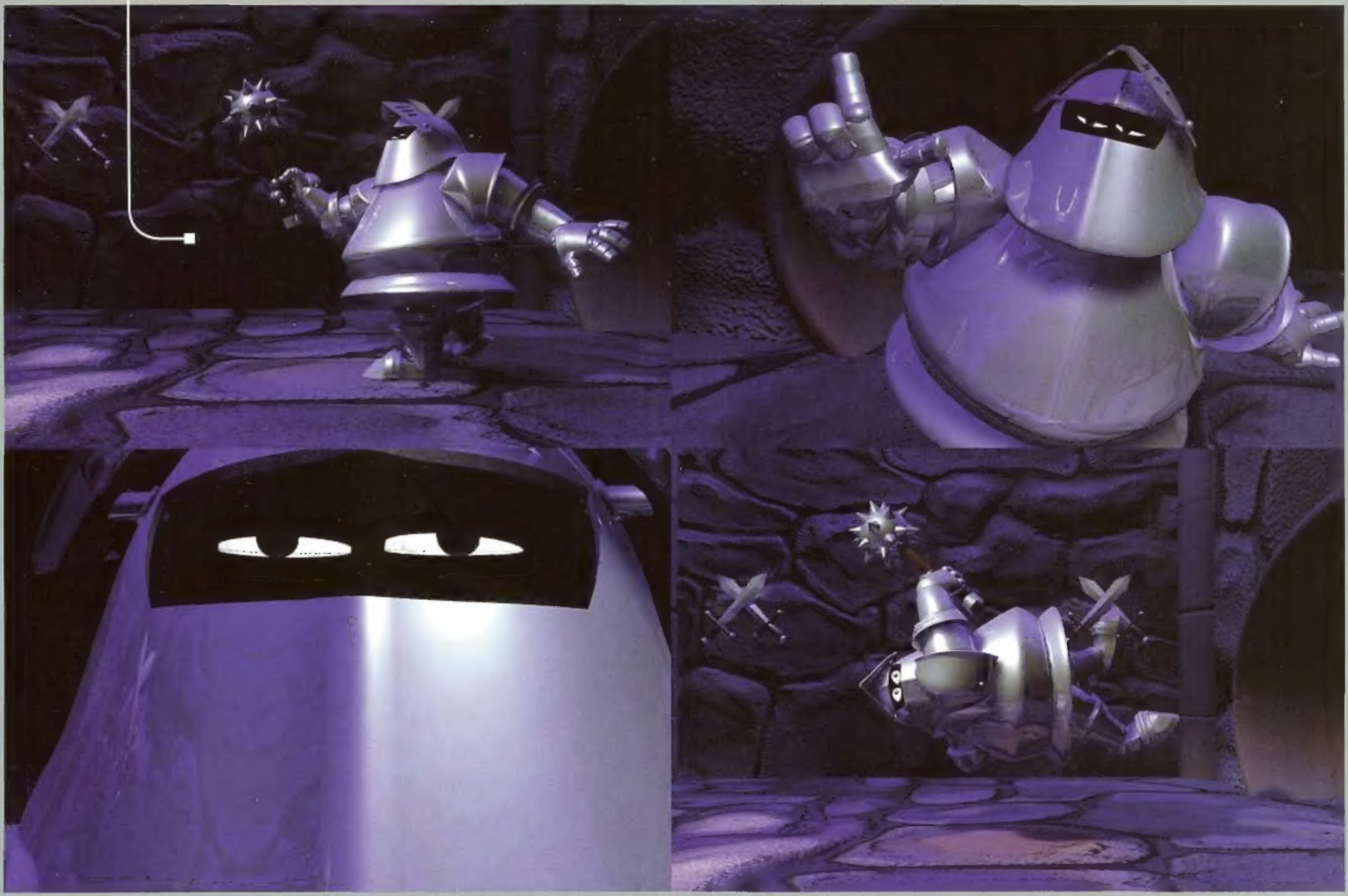

GABRIEL J GARCIA Joey
Cinema 4D R8

"I'm 16 years old, doing freelance work mainly for websites. I started doing 3D about two years ago and I'm completely self-taught. Most of the 3D robots you see nowadays look very human and smooth, like the *I, Robot* droids and the one on the cover of issue 62, so I thought I'd do a blockier robot."

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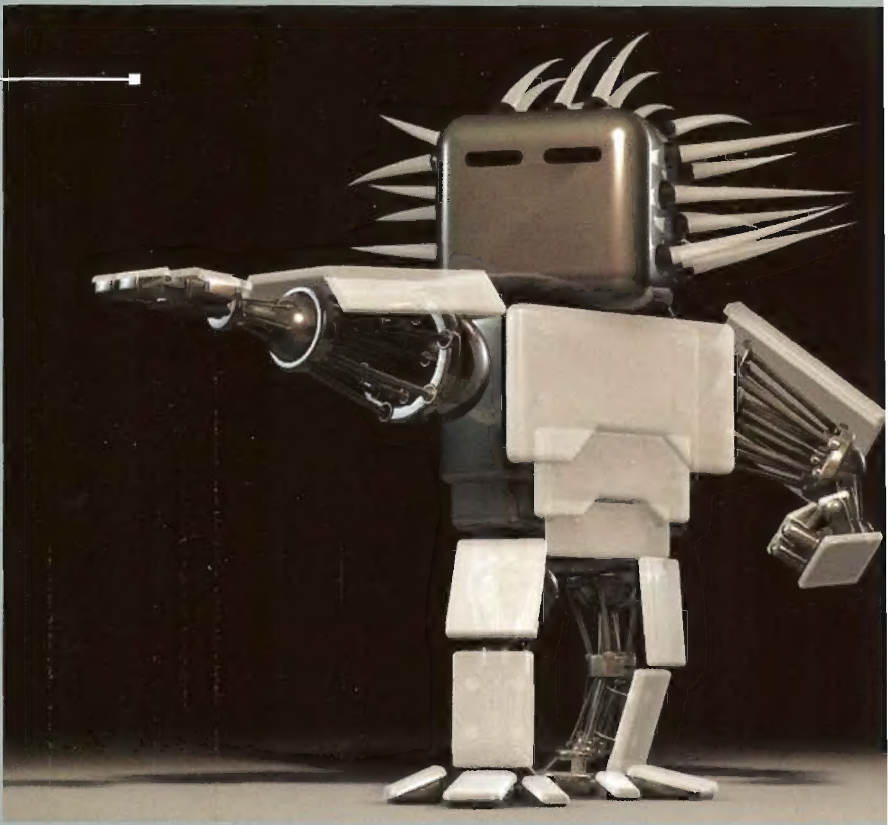
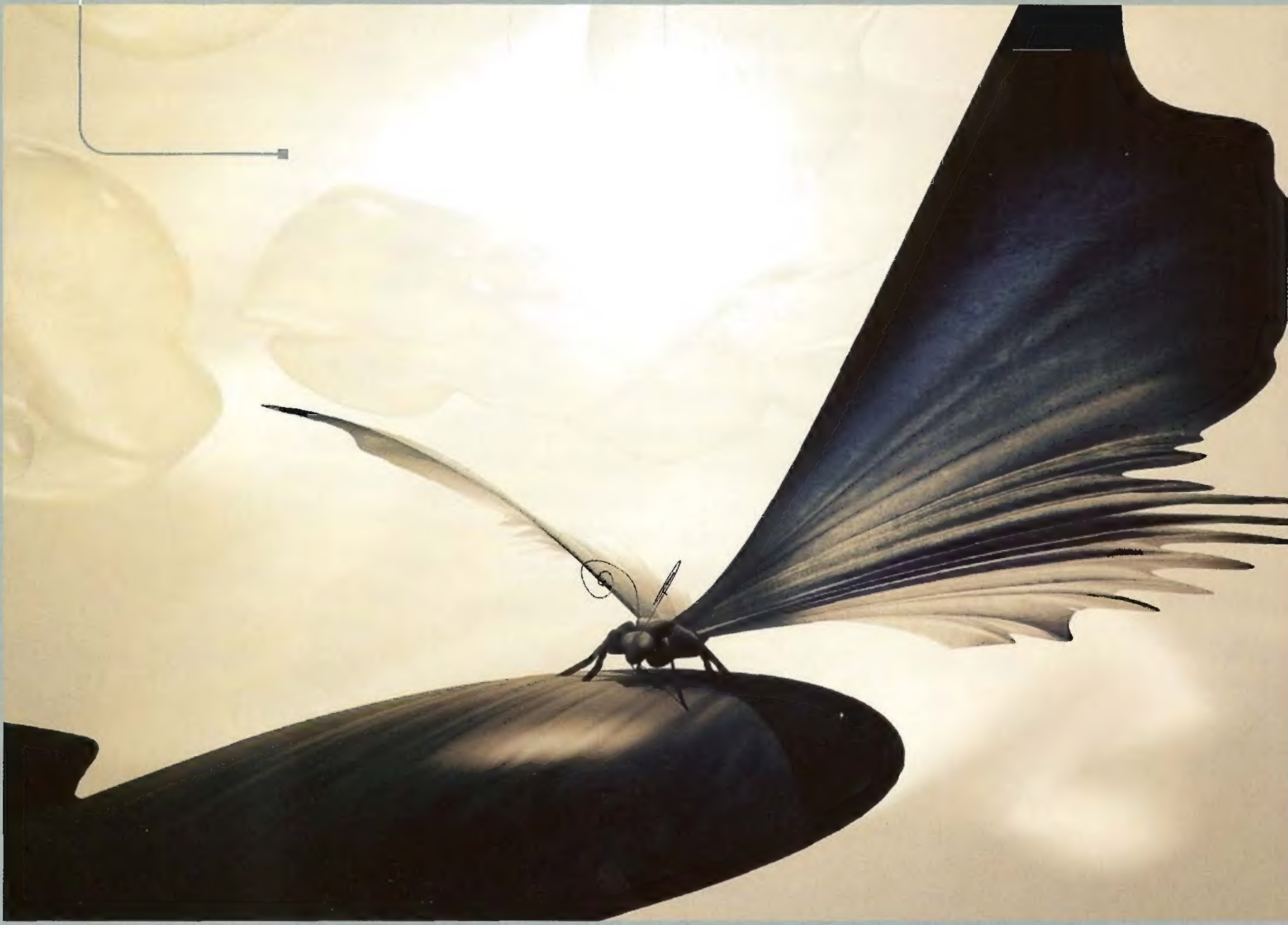
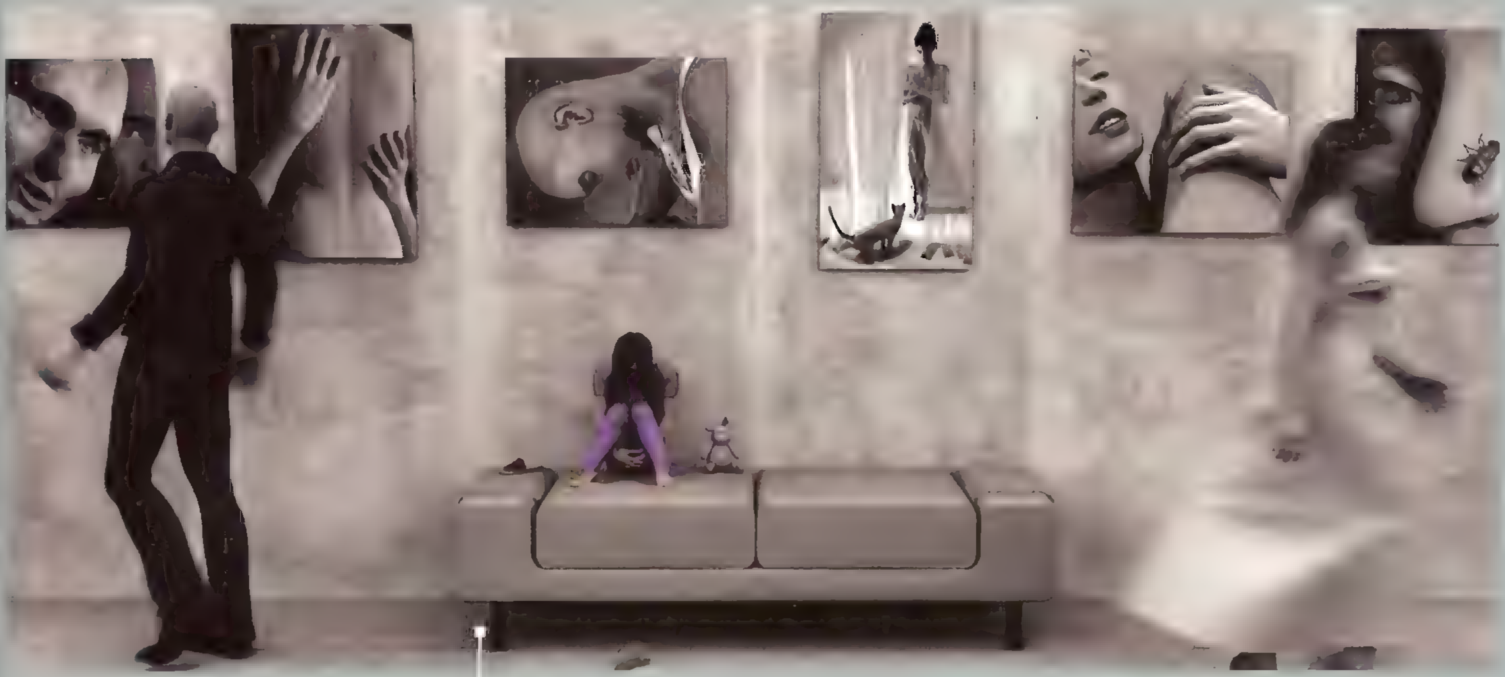


JUKKA KORHONEN New Wings
trueSpace, CorelDRAW GS 12

I'm working as a producer and digital special effects supervisor at CopperSky Productions, a motion picture production company in Finland. The *New Wings* image features three rendered layers; one is the original scene, the second render is fake GI shadows and the third features the raytraced shadows."

[e] jukka.korhonen@coppersky.fi





MICHAEL LOGUE Color Blind
3ds max 5.1, Poser 5, Brazil r/s, BodyStudio, Corel PHOTO-PAINT 8

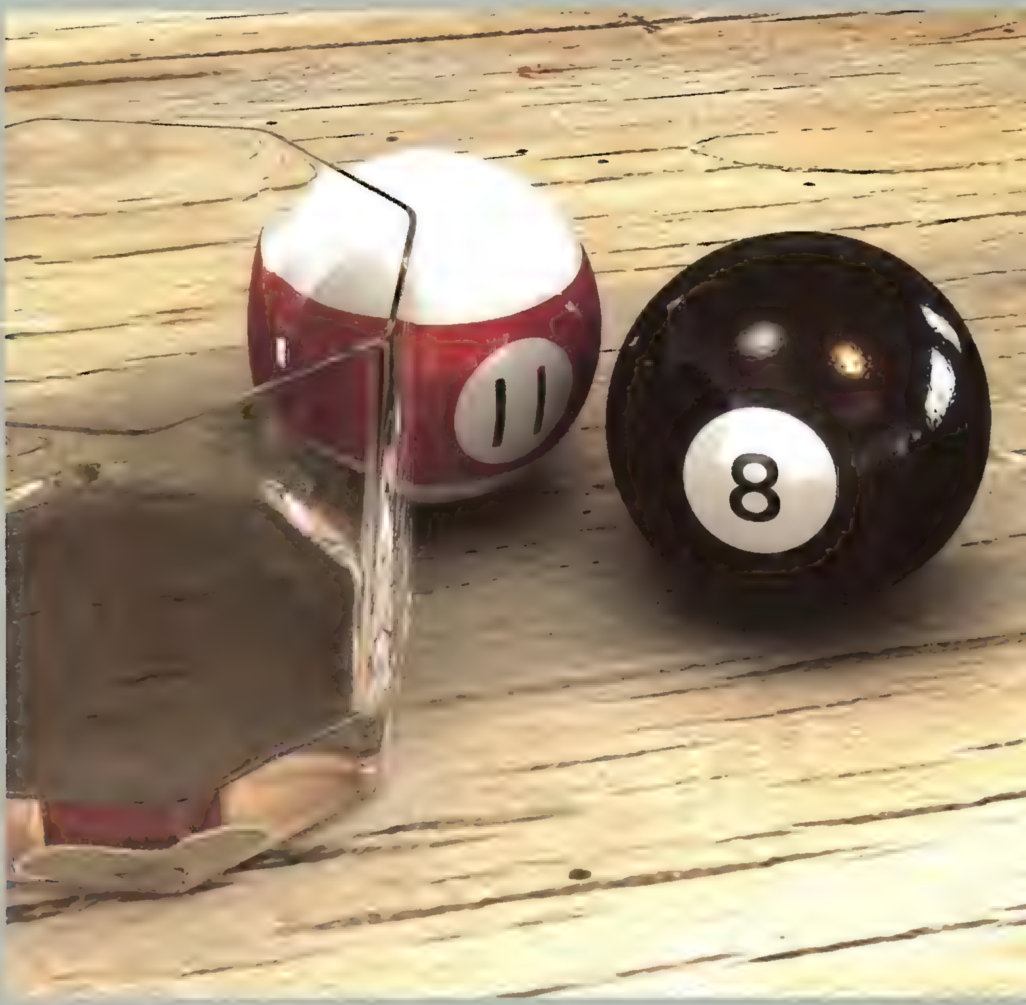
"I don't really consider myself a 3D artist, I see myself more as a 'virtual photographer'. I'm not much of a modeller; I simply set up scenes, adjust the lighting, position the characters and snap the shot. This scene constitutes my 'virtual photo gallery'; all the 'photos' were also done in 3D."

[e] michaelplogue@yahoo.com

TRAVIS WILLIAMS Viper, Glass
3ds max

"I'm a fan of the Dodge Viper and chose to model it for my first 3D car. I used the Poly modelling technique, working on and off over a six-month period. *Glass* was modelled in only a few minutes."

[e] travis_w@optusnet.com.au
[w] www.mayhemation.com



RENDEROSITY GALLERY

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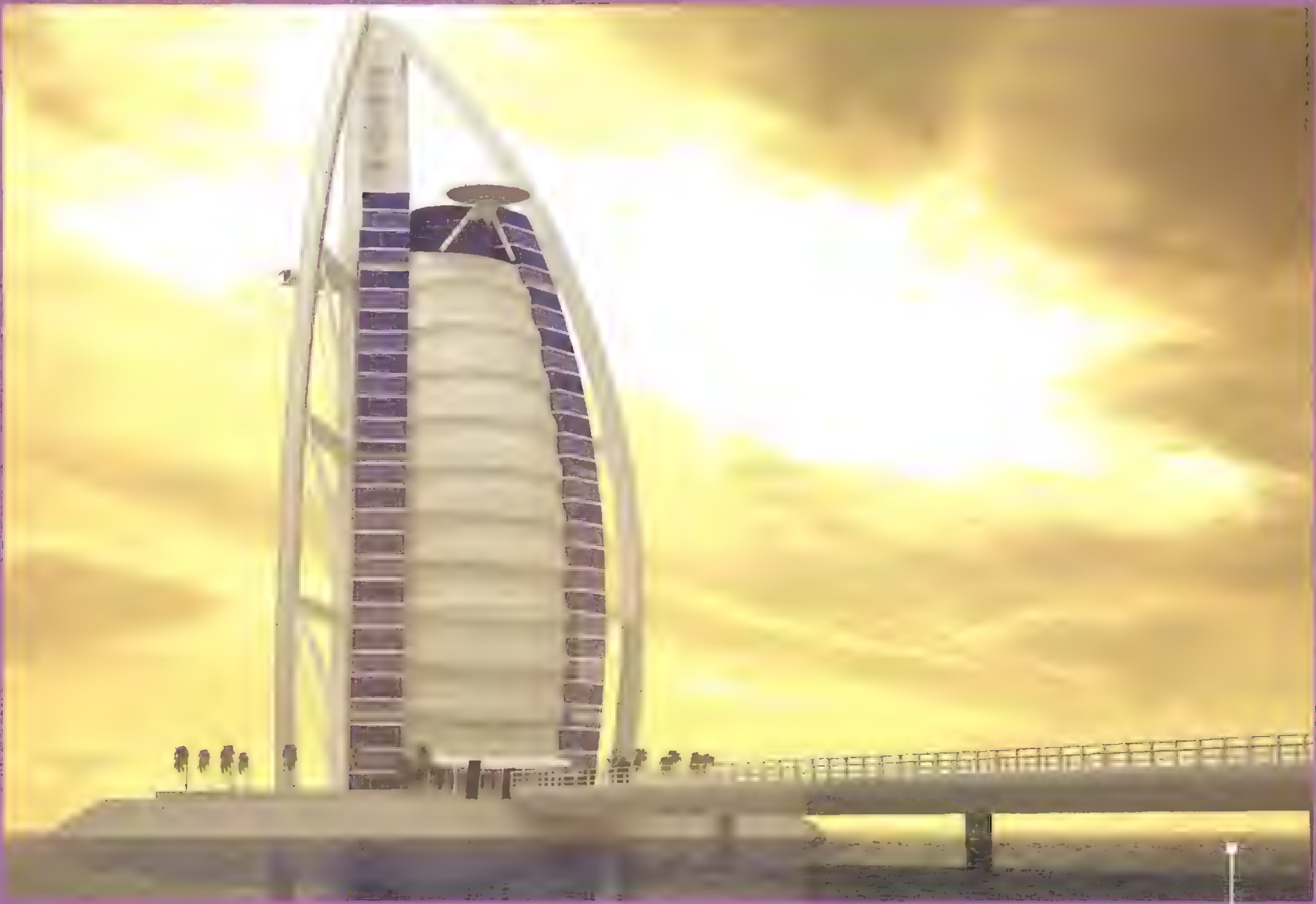
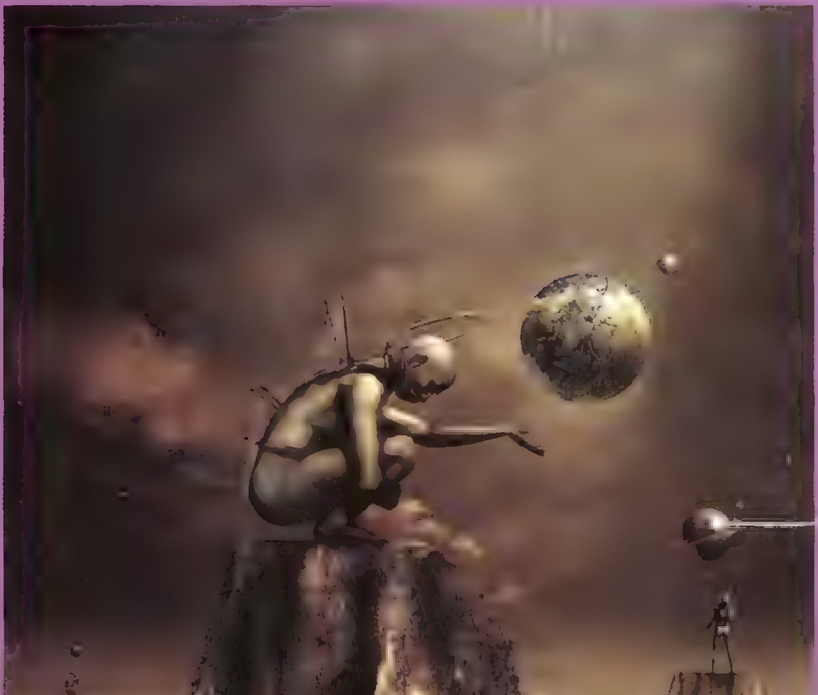




STEPHAN S Burj Al Arab

Bryce

"I'm 21 years old and I live in Vienna, Austria. I started using *Bryce 5* during my last year of secondary school and developed an interest in architectural models. After I finished school and military service I discovered *Cinema 4D*. Although *Cinema 4D* offers more modelling and rendering tools, I didn't stop working with *Bryce*; I'm switching between the packages. Last year I started to study architecture at the Vienna University of Technology, where I can hopefully improve my 3D modelling abilities."

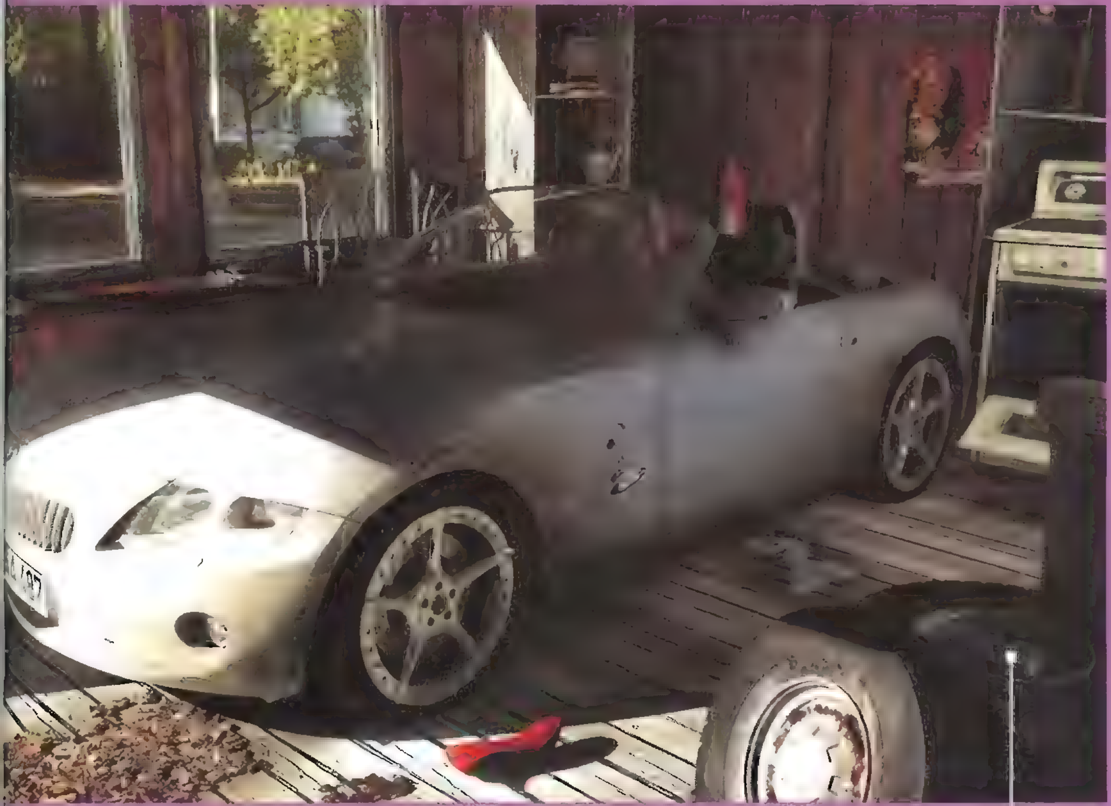
[illegible]

DAVID H God's Project

Poser, Photoshop

David Ho's works have been featured in numerous publications including *Heavy Metal, EFX Art* and *Design*. His work is showcased in *Renderosity: Digital Art for the 21st Century* and his own publication *Shadow Maker: the Digital Art of David Ho*. Most recently he won first place in the digital gallery art competition at Macworld Expo.

[illegible]



HOLGER SCHOMANN **Driving is Not Easy...**
Cinema 4D

"I'm 35 and I've been a freelance 3D artist for the last two years. I write for computer and 3D magazines, and I work with *Cinema 4D*, *MotionBuilder* and *Maxwell Render*.

[e] holger.schoemann@t-online.de
[w] www.renderosity.com/homepage.ez?Who=schoemann

GREG NARA **The Need for Peaceful Times, Child at Heart**
Cinema 4D, Vue

"I use *Bryce*, *Poser* and *Vue* a lot. I also use *Maya PLE*, *Cinema 4D* and *3ds max*, but some of the most fun programs I've used are little ones that do a unique job, such as *Shape Magic*, *Twig*, *UVMapper* or *Apophysis*, which produce amazing results and cost little or no money."

[e] gtn@nis.net
[w] www.renderosity.com/homepage.ez?Who=iodine_angel

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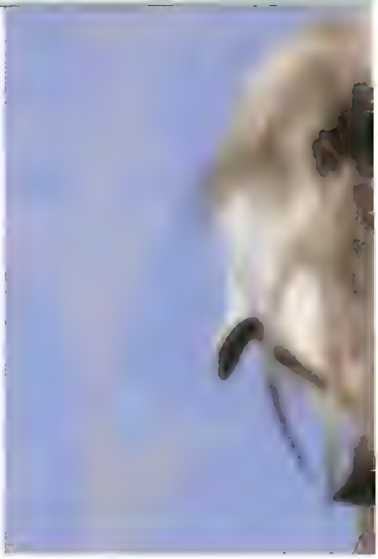


Best Short: famous for fifteen minutes?

OSCARS ANALYSIS At the Oscars, a low-key battle was fought out in the Best Animated Short Film category. But is it fair that shorts created by indie artists still have to compete with big-budget fare?

Cutting comments from host Chris Rock aside, the 77th Academy Awards were a familiar affair, with the usual controversies over landslide victories (*Million Dollar Baby*), ignored auteurs (Martin Scorsese) and defeated Brits (Imelda Staunton, Kate Winslet et al). But few could argue with the decision of the judges in the Best Short Film (Animated) category. Chris Landreth walked away with the Oscar for the wildly ambitious *Ryan*. Establishing a kind of 3D CG documentary genre, *Ryan* has been widely hailed as a masterpiece since its premiere at last year's Cannes film festival.

This year's other nominations were *Gopher Broke*, by Jeff Fowler and Tim Miller at Blur Studio, *Guard Dog* by Bill Plympton Productions; *Lorenzo*, by Mike Gabriel and Baker Bloodworth at Walt Disney Pictures; and the Australian Film, TV and Radio School production *Birthday Boy*, by Sejong Park and Andrew Gregory – the now well established mix of student work, small studio production, and major animation house creation, in other words. But, given that the manpower and budgets available to a couple of students are a world away from those available to the big studios, does a healthy looking cross-section of entries necessarily result in a fair fight? Although Landreth flew the flag for the independents this time out, Pixar, Sony Imageworks and Blue Sky have dominated in recent years.

"I can certainly see how some independent filmmakers might feel pissed off that their films have to compete against larger-budget efforts, but what can you do?" said Tim Miller, Creative Director and President of Blur Studio. "The Oscars, as it currently stands, are simply a 'may the best film win' competition, with no regard paid to how something was made, or the goals of those making it. But there are still lots of other festivals that focus on the independent and lower-budget films, and they can gather kudos there."

2001 Oscar nominee Ruairi Robinson recalls how his own short, *Fifty Percent Grey*, was pitted against higher-budget fare. "My short cost ten thousand Euros, whereas Pixar's winning entry, *For The Birds*, apparently cost four million dollars. So yeah, of course there's conflict. But it still really just boils down to having a good idea and executing it well." Robinson even suggests that the smaller guys may have an advantage. "I suspect it's harder to get a short made at a studio. Everyone has an opinion, and it doesn't work trying to tell stories by committee."

> **"MY SHORT COST 10,000 EUROS, WHEREAS FOR THE BIRDS COST FOUR MILLION DOLLARS"**
>
> RUAIRI ROBINSON, 2001 OSCAR NOMINEE

Some might argue that the larger studios aren't even entering into the spirit of the competition, producing shorts that are more of a technical test bed than a creative endeavour, or cynically entering films for Oscar consideration purely as a stepping stone to feature work.

"I don't know if other places regard them that way but we certainly don't," says Miller. "First and foremost, we create shorts because we enjoy them. It's a welcome change to create animation for the sake of art rather than trying to meet some commercial goal. If the shorts help to convince folks that Blur could handle animated features then that's great, and a fortunate by-product is that it sometimes enables us to create further short films. But it's not the impetus for doing them."

Marc Craste, director of the BAFTA-winning short *Jojo in the Stars*, is also dismissive about the argument against entries that

PLUGGED IN

CINEMA 4D 9.1

Maxon is keeping those *Cinema* users' fingers busy with its new upgrade to version 9.1. The point release includes 50 new features and enhancements, with the focus on data exchange, n-gons, the interface and the material system. *Cinema 4D* projects can now be transferred to Apple's *Motion*. For a complete list of the new features in *Cinema 4D 9.1*, visit the site below.

www.maxon.net

● Chris Landreth's short animated film, *Ryan*, won Best Animated Short Film at the 77th Academy Awards

TALKING POINT | The long and the short of it

"No matter how cynical one is about awards, there is cachet in winning such major accolades. *Jojo* winning at [the UK-based short film festival] Brief Encounters also had a great impact, though, as it was about recognition from industry peers. It won based on the combination of story and execution, not simply because it was a 'nice piece of animation'."

Marc Craste
Director, BAFTA-winning *Jo Jo In The Stars*

"I don't think the bigger studios are squeezing our opportunities. There's a very different rationale behind a big budget and smaller, 'independent' projects. A good story, well told, shouldn't be affected by the number of people working on it."

Ruairi Robinson
Director, Oscar-nominated
Fifty Percent Grey

"The Oscar nomination most definitely puts us on a few new radars. I'll let you know how it actually helps in a few months, though – right now, it's just making the phone ring!"

Tim Miller
Creative Director and President, Blur Studio (creators of Oscar-nominated *Gopher Broke*)

benefit from larger budgets and new technologies. "Some shorts have been known to be R&D from a large studio, perhaps a way of testing a technique before principal filming starts, but they are projects in their own right nonetheless. When there's obvious passion then it has be viewed as good work regardless."

A recent Reuters report highlighted the fact that, for actors at least, Academy nominations and wins don't necessarily boost box-office appeal. And, if that's the case, then can a listing in a relatively minor category at a mainstream awards ceremony really make a significant impact? "I'm currently directing a series of animated commercials for an agency in Canada," said Robinson. "This is my first big international job, and the reason I have it is because they saw *Fifty Percent Grey*. So I guess it is starting to pay off, finally. Not that it's done much good for funding what I want to be doing, which is shooting live-action stuff."

"It can make a huge, whopping impact," says Craste. "Winning one of the 'big ones' opened lots of doors that were hitherto closed, and had a definite an impact on my credibility as a director."

Now is a better time than ever for independent short filmmakers, reckons Craste. He believes the affordability of post-production tools (such as *After Effects*) has revolutionised the filmmaking process. The power of the internet, including dedicated shorts websites such as iFilm, has helped foster an active short community, helping to level the playing field for reaching an audience into the bargain.

"I think there are some really great filmmakers doing shorts right now," adds Miller. "I watched all the 40 entries that qualified for the Oscars race and there were some stellar films in the mix. Some that got shortlisted, like Tomek Baginski's *Fallen Art*, could easily have made the final five. I've also seen super work at festivals and on the web. They're out there, and they're entertaining and inspiring." ●

FEED › ‹ BACK

We want to hear from you on the issues affecting 3D artists, so from now on, once you've read our main news story on the facing page, why not visit our forum and post your reaction to it online?

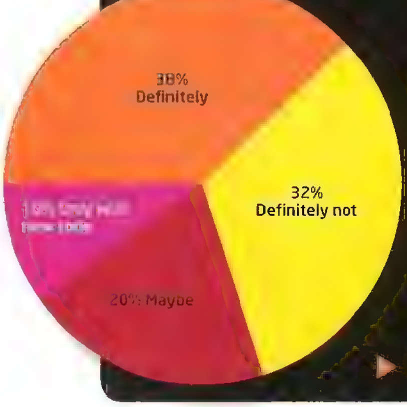
This issue's question concerns the Best Animated Short Film Oscar. There's been an uneasy mix of entrants over the years, with significant disparities in the scope and budget of their projects. Yet recently the judges seem to be favouring the indies, with Chris Landreth's *Ryan* taking this year's accolade.

Is it still fair that mighty animation giants like Pixar compete directly with independent filmmakers on shoestring budgets?

● Of course it's fair – a good story and quality filmmaking will always rise to the top
● It's irrelevant – the judges probably take the film's production budgets into account anyway
● It's unfair – imagine what indie filmmakers could do with even 10 per cent of Pixar's short film budget
● It's all about money – companies use the category as a springboard into films, filmmakers use it as an industry calling card

LAST ISSUE: THE VERDICT

"If there were a wider choice of high-end 3D apps on the Mac, would you consider switching?



endorphin 2.0

SOFTWARE NaturalMotion launches endorphin 2 at GDC 2005, adding multi-layered behaviours

THE FRONTIERS OF behavioural animation continue to expand in the jumping, springing and otherwise death-defying form of *endorphin*, NaturalMotion's dynamic motion synthesis software. Now onto version 2 (announced at GDC), the software's virtual stuntmen have been granted multi-layer behaviours along with new adaptive behaviour abilities, such as jumping, by their UK-based developer parents. "One of the most requested features was the abilities to use multiple behaviours at the same time," said Torsten Reil, NaturalMotion CEO. "This can now be done by layering behaviours and assigning them to different body parts, for example using a 'jump' behaviour on the legs, and a 'catch ball' behaviour on the top of the body."

But while *endorphin 2* is a big step, Reil believes the new version is just the beginning. "We have Behaviours Engineers working on current and future AI controllers to mimic the human nervous system. While we won't see a fully adaptive dancing ballerina next year, we're making very good progress covering most basic human motor skills. Our other big focus is creating techniques for letting the animator fully control the synthesis process." *endorphin* 2 costs $12,795.

www.naturalmotion.com

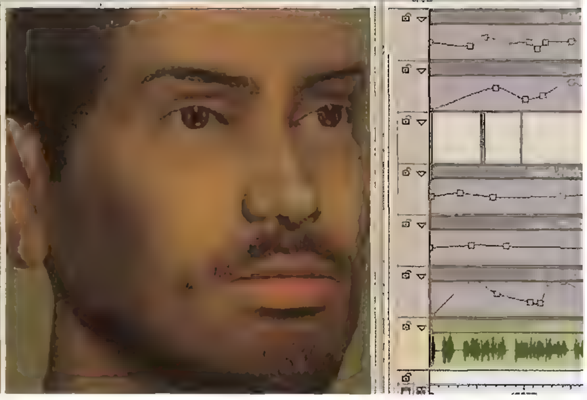
PLUGGED IN

LIGHTWORKS 7.5

Sheffield-based rendering software developer LightWorks Design has announced version 7.5 of *LightWorks*, its flagship render engine which is embedded in over 80 software applications. Improvements include LightWorks Real-time, a single API enabling interactive rendering using portable *LightWorks* shaders that operate seamlessly in both hardware and software rendering. *LightWorks*' Global Illumination has also been improved, with a range of features making it easier for users to create high-quality images using radiosity, and there are new interface components enabling interactive light editing and new shader editors.

www.lightworkdesign.com

Created using *LightWorks*



LIFESTUDIO:HEAD 2.6 SHIPS

SOFTWARE LifeMode Interactive adds multi-format support to its facial animation and lip-sync solution

LIFESTUDIO:HEAD, a lip-sync and facial animation app from LifeMode Interactive (somewhat uniquely based in Moscow, San Francisco and Weybridge, Surrey), was launched back in 2002 as a Windows-only solution. Since its debut at the now sadly defunct Digital Arts World show, LifeMode Interactive claims that games developers have been clamouring for multi-platform support for the *LifeStudio:Head* SDK. Now version 2.6, developed in tandem with several major UK games companies, answers the call with support for PlayStation 2, Xbox and Windows.

LifeStudio:Head 2.6's real-time non-linear technology includes libraries of character templates and tools for modelling, texturing, automated lip-synch, and other facial animation features, and also supports export/import plug-ins with *3ds max* and *Maya*.

The SDK version's facial animation engine can be incorporated into a game engine such as *RenderWare*, which treats characters' heads as separate objects attached to a skeleton, and animated by means of *LifeStudio:Head's* facial animation engine. The system offers automatic support for four levels of detail, storing one head mesh per animated character per LOD. Animations and lip-synch can be blended in the game's run-time engine, generating real-time emotions and enabling characters' eyes to automatically follow moving objects in 3D scenes. There are various versions of *LifeStudio:Head*, so visit the site to find out more about pricing and licensing.w

www.lifemi.com

PLUGGED IN

ALL HAIL THE TURBO SQUID

New Orleans-based Digimation, creators of 3D asset website Turbo Squid, which launched in January 2000 and was covered in issue 05 of *3D World*, has recently announced the placement of its 100,000th 3D model for sale. The milestone product is a low-poly parking meter in .max and .3ds format, and was produced by Turbo Squid member K. Garrow.

www.turbosquid.com

WEBSITE OF THE MONTH

www.boring3d.com

WHAT A DIFFERENCE a year makes. Or doesn't really, in the case of Boring3D, that legendary online treasure trove of 3D oddities [illegible] from the unique [illegible] of creator Jimmy Maidens.

Using *3ds max* and *V-Ray*, Boring3D's [illegible] 3D renders and cast of extremely offbeat characters (including a robot in Speedos, Bob and Mining Guy) has been a staple ingredient of many a 3D artist's day [illegible]. After a year's break with a (semi) [illegible] for the sole reason that he 'just can't stand not working on Boring3D any more'. Amen to that – one look at Tomatoes don't yet [illegible] them' or The chickens admire Rooster's curves (above) confirms that he's lost none of his talent for the trademark craziness that made him a legend in the 3D community. Boring3D is surely everyone's favourite desktop wallpaper. And is there any higher accolade than that?

Further sites...

www.computerarts.co.uk

Subscribers to *3D World* should head over to the website of our sister magazine, *Computer Arts*. It's been redesigned to make it a much handier resource, and your subscription now grants you access to hundreds of tutorials, including those from *3D World*, covering the gamut of digital content creation to download for free – a saving of up to £2.50 per tutorial. So if you've not subscribed yet, what are you waiting for?

Projects round-up

This issue: gadget junkies, glue boys, space monkeys, time chickens and lava

[illegible]

It's sticky situations aplenty in the latest Pepsi ad, *Glue Boy*. An office worker hangs from a skyscraper window with balls of glue on his hands and feet, then flips head over heels down the side of the building. What's amazing is that, where his first flip is shot on set, the rest are all 3D – including a replica of the actor. The Mill's Jordi Bares says: "We rotoscoped the actor position in his first frame and take-over frame, then animated him. We've modified real actor footage while maintaining realistic motion by using *endorphin* as an animation tool as well as a simulation tool."

www.the-mill.com

[illegible]

Lennon the dog and Abe the monkey have been sent into space, and there's little to do but play 'I Spy'. This superb *Maya* animation is the self-promotional work of post-production outfit One. "January is a time when companies find they're a bit quieter, but are also starting to look at new projects – we sent this round to remind everyone of our talented 3D department," says Toby Abbott, Head of Production. "The biggest issue was file size – detail can get lost during compression, and we wanted to keep it under 3MB. We hope to continue the story throughout the year."

www.onepost.tv

[illegible]

To celebrate 75 years of PG Tips tea, the latest ad from Aardman throws open the kitchen cupboard doors during five different decades, from the '30s to the present day. "To emphasise the differences between each separate vignette we used contrasting film styles," says director Darren Robbie. "We go through various film changes, from the '30s, shot in scratchy, grainy, black and white with a dose of sepia, to the '70s, which has a bright and heavily saturated look, up to the recognisable present-day shot." Post-production was done by Rushes.

www.aardman.com; www.rushes.co.uk

[illegible]

Lola Post has created 214 effects shots for the BBC's new fact-based drama, *Supervolcano*, which imagines the devastating consequences of the supervolcano at Yellowstone Park erupting. "Nobody has ever seen a super-eruption happen," says Grahame Andrew, Visual Effects Supervisor at Lola. "The crater at Yellowstone is enormous – over 80km long by 45km wide." Lola used particle effects, filmed at high speed using a 'cloud tank', enhanced with CG elements to create more organic columns of ash and pyroclastic flows than particle systems alone could provide.

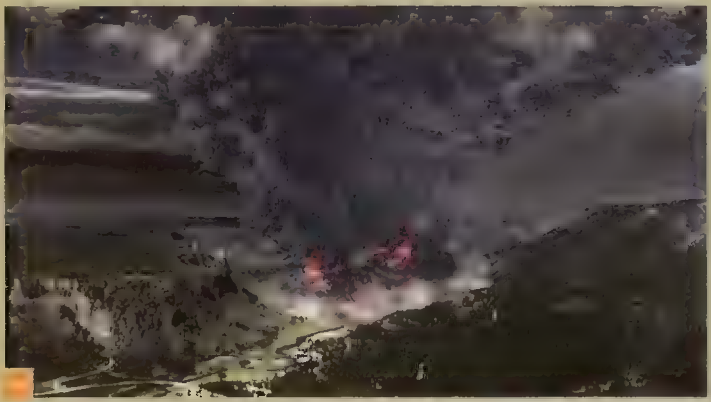
www.lola-post.com

[illegible]

Created by Chris Morris of *Brass Eye* fame, Channel 4's Nathan Barley believes he's the king of urban cool, sporting his 'well weapon' WASP T12 phone. "Chris had loads of input," says Framestore CFC Producer Simon Whalley. "The effects ranged from making DV footage look like it was streaming from a website – we compressed it to get a *QuickTime* look – to the WASP animations. These were created in *inferno*; the body was made from spheres cut in half and elongated and the head and tail were made by extruding Dingbat text and animating these 3D shapes."

www.framestore-cfc.com; www.trashbat.co.ck

STAR WARS



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+ POLAR OPPOSITES -

We ask two industry gurus - Markus Manninen of DreamWorks and Dave Throssell of MillTV - which offers more for the 3D artist: working in films or working in TV?

"THERE ARE PEOPLE who do that?" I was at work early on a Saturday morning last year to check my render, and I quickly found out that at DreamWorks there are people whose job it is to manage the render farm so that I don't have to come in early, nor on weekends. I also realised that in the excitement of getting the first render on the show done, I had forgotten where I was meant to be working.

Life in animated feature films is both challenging and liberating. The challenge is in creating an interesting world full of appealing original characters, doing things we could never have imagined a short time before - and most of all, telling a compelling story.

As if that wasn't enough, we get to push the boundaries of what can be done in computer graphics. But while each film has its own Mount Everest to climb, it is also liberating working in an environment and with tools that have been used to deliver previous animated films, and working with people who are experts in their field. It's interesting having your directors, producers, designers, artists, animators, technical directors and developers under one roof, all working together towards a common goal. Films really are the ultimate team effort.

So can one person really make a difference? Absolutely: each and every artist does. The challenges we set out to overcome all come down to making good decisions every single day: in animated films, the 'quick fix' simply isn't possible. Instead, we spend more time making sure that we have good, robust and efficient solutions in place once we start shot production. It's up to everyone involved to be part of finding the best solutions for the film, both artistically and technically.

Filmmaking in the modern studio is a marathon - and it's impossible to set out on a marathon at a sprint. The best creative and technical talent does its best work in a nurturing and collaborative environment, with positive input that comes from life outside of work. I find working with people who have a genuine existence outside of work much more rewarding: they are awake, alert, motivated, and have perspective on life itself. Ultimately, I believe they are better artists because of it, and that they also make better collaborators.

But for me, the most important aspect of working in films is being in the process from the beginning. I can be part of a vision being created, and after working in many different areas of the industry, this is definitely what I enjoy the most.

Having contemplated all this, I'll take a moment to walk down to the commissary, get some frozen yogurt from the machine, sit down in the sun, and ponder if there is anything more I can do today to make sure that the movie is all that it can be - because that is what I am here to do.

> EACH ANIMATED FEATURE FILM HAS ITS OWN MOUNT EVEREST TO CLIMB
>
> MARKUS MANNINEN, DREAMWORKS

[illegible]
www.dreamworks.com

Dave Throssell is Head of MillTV, the London-based TV department of The Mill. He's recently finished work on the BBC docu-drama *Genghis Khan*.
www.the-mill.com

I'VE SPENT THE last 20-plus years working for the small screen, firstly on commercials and more recently on long-form TV, and in all that time, have had no desire at all to start working on visual effects for films. My reasons are probably shallow and misguided but based on the following criteria.

Firstly, I actually like clients. The people who bring projects to The Mill may be occasionally exasperating but also the some of the most talented and creative in town. Be it the latest 'off the wall' commercial or a dedicated documentary maker, they are always fascinating to work with. When a client slaps the storyboard on the table, you're never quite sure what you're going to get and what their fevered imaginations have come up with. Films don't seem to have this level of constant client interaction.

Secondly, the timescales. Commercials are in and out of the building over a period of days or weeks. Whatever you feel about a particular project, you know that it'll be out the door before long and you'll be onto something new. If you don't connect with your current client, you know they'll be gone by the weekend and another one will come striding through the door. Even on long-form TV projects you'll never spend three months working on a shot only to find it has been cut, as there's never the budget to work on a shot for that long. I feel that the timescales would also affect the rate of technical change: if you're working on a big project for a year, there's no way that you're going to jump to the latest version of software midway. On short commercials projects, you're much more likely to be using the latest technology and the latest versions of your software.

The subject of creativity comes next. I can quite believe that in working on a high-budget film with long timescales you have to reach within yourself to scale new heights of personal creativity. However, when you work on these big projects there's always someone more qualified to come up with design solutions than you. Unless you're the VFX Supervisor or Director, it's not your job. On a TV project you have flexibility to be creative, whether it's working out how to create *Lord of the Rings* on a shoestring or getting deep into the science when explaining recombinant DNA in five shots. You have huge input into the look of the project.

The final reasons for preferring TV over film are rather more lightweight, but important nonetheless: my parents are too old to go out to see films, and all my friends have young kids - so if I do anything interesting, they're more likely to see it if it's on TV. Then there's the whole American thing. Film is dominated by people who start work eight hours after we do in the UK, and every time we do a film project I end up on the phone when I'd prefer to be in the pub. And if that's not a good reason to avoid film work, I don't know what is...

> WORKING IN TV, YOU HAVE A HUGE INPUT INTO THE LOOK OF A PROJECT
>
> DAVE THROSSELL, HEAD OF 3D, MILLTV

PLUGGED IN

TRANSPOSER 2

Eovia has launched *TransPoser 2*, an update to its plug-in enabling the import of *Poser 4* and *5* content into *Carrara 4* – now including *Poser 5*'s dynamic hair (and animation). *TransPoser 2* includes *Poser* files in *Carrara*'s network rendering, letting users update *Poser* figures from within *Carrara*. The plug-in comes with *Michael* and *Victoria 3* and costs $129.
www.eovia.com

TRANSPOSER 2

PLUGGED IN

CLAY TOOLS

SensAble Technologies has announced version 1 of *ClayTools*, a new modelling product for *3ds max*. *ClayTools*' touch-based modelling uses a 'true' 3D interface with force feedback, and Sensable claims it's especially suited to organic modelling tasks. Users can smudge, smooth, carve, and tug at their virtual clay models just as a sculptor would with real clay. *ClayTools* costs $2,795.
[illegible]

'Esuvee' ad

In a bid to promote driver safety, Framestore CFC set its most ambitious ad to date at a rodeo, putting hairs on the chest (and back) of a bucking four-by-four

BY MARK RAMSHAW

Adverts selling safety aren't generally as sexy as those generating desirability for the latest car, mobile phone, or similar luxury item. But this spot, created for the American market as part of the settlement of a lawsuit against the Ford Motor Company, dramatically breaks from the herd. It's unusual, not only for the way it turns a serious sermon of the need to handle top-heavy sports utility vehicles with care into something genuinely entertaining, but also for the fact that real cars don't even feature. Instead, this breed of roll-prone vehicle is represented by a giant shaggy-haired creature, the 'Esuvee'.

With just three months to put the ad together, and the need to create complex shots filled with dynamic hair posing a massive technical challenge, the team at Framestore CFC began pre-production six weeks before the live shoot: "We extrapolated side and front views from the agency's original design, and then dived straight into 3D modelling," says CGI Supervisor Andy Boyd. "We did a lot of animation cycles to see what kind of movement would suit the beast, from making it run like a bison, a dog, even a prehistoric mammoth. But the motion that worked best was that of a tiger."

By far the biggest challenge on the project was the creation of the Esuvee's coat. Co-CGI Supervisor Jake Mengers oversaw this work: "We tested numerous ways of achieving the look of the hair, including using *Maya* Hair to generate dynamic curves, which would control the movement of a Fur description," he says. "But in the end, Paint Effects gave us the best look and is far more scalable. By attaching a PFX hair brush to the dynamic curves, *Maya* rendered much more efficiently, even when dealing with thousands of strokes."

The creature, modelled with polys and Sub-Ds, was split into around 20 patches, onto which hair follicles were painted. "The fewer follicles we used, the smaller the creature looked," says Boyd. "To give the impression of a 16-foot-long beast required around 80,000 follicles." Using patches prevented each hair system from interacting with its neighbours, but allowed for greater control over the overall look, and made it easier to modify in any one area. "It also meant we were able to render only the sections visible in a shot," adds Mengers. The hair density soon began to make management of a single scene untenable. "The only way to create the hair at any pace was by working on sections, and then going through the painful process of combining them into a master scene," says Mengers. "By the time all the hair was painted on the creature, the scene took about an hour to save."

THE HUMP OF THE BEAST

Once the hair was in place, it needed to be groomed and settled naturally. *Maya*'s standard tools didn't create the desired flow, making it necessary to manually position the dynamic control curves for each hair clump. Numerous MEL scripts were also written that allowed hair trimming and length randomisation. The Paint Effects hair brushes were then applied to the curves, with the look of the hair varied across the beast, and final rendering parameters defined. "The beast's hump and shoulders had very long shaggy hair, blending down the front legs into short, stiff fur, then medium-length matted hair," says Technical Director David Mellor. "Down the back of the body, the hair would become gradually shorter, appearing almost horse-like over the rump and upper thighs. They all had to blend together to form one cohesive surface." When it came to animation, the team had to take the complexities of the hair simulation into account: "They'd take a 10-20 frame 'run up' for each shot, to give the hair time to settle into its natural motion," says Mengers.

The combination of perfect compositing, the convincingly animated rug and beautifully realised digital hair result in one of the most photoreal creature ads produced. The giant Esuvees look more like the work of veteran puppeteers from Jim Henson's Creature Shop than the creation of a digital studio such as Framestore CFC. Whether such artistry will encourage SUV owners to drive more carefully is another matter…

'Esuvee' is currently being shown in cinemas across the USA. The advert can also be viewed online at www.framestore-cfc.com/commercials/esuvee

DETAILS

TITLE
'Esuvee

AGENCY
BBH

DIRECTOR
Danny Kleinman

RUNNING TIME
60 seconds

FIRST BROADCAST
31 January 2005

WEBSITE
www.framestore-cfc.com

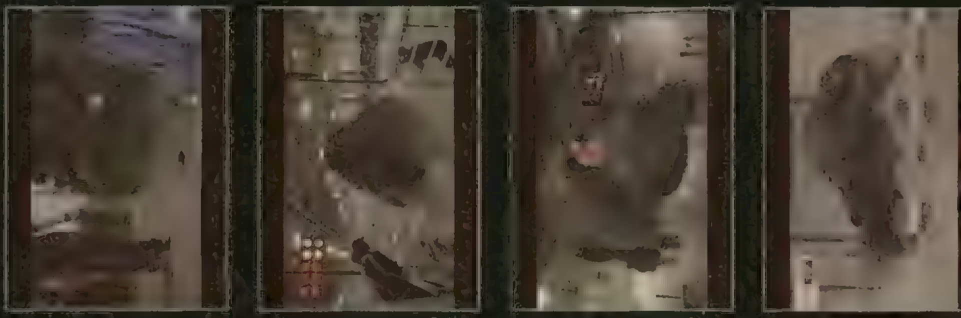
TEAM SIZE
19

TIME TAKEN
Three months

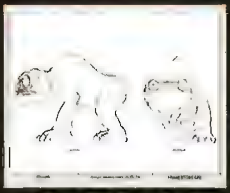
SOFTWARE USED
Maya, inferno

FREEZE FRAME

The ad opens at a rodeo barn. Next we see a young man looking smug and confident astride an animal in the holding pen. The bell sounds and the gates open. The animal and rider bound out into the arena. The creature is an 'Esuvee'. It has the eyes of a car, but the hair-covered body and exaggerated movements of a wild, four-legged animal. "Not everybody rides an esuvee right," says an expert. The ad cuts to a herd of Esuvees stampeding over the plains. Cut back to the rodeo, and the rider takes a corner too hard, rolling the creature onto its side. The next contestant tries his luck, showing how "keeping an esuvee on all fours" is the key to controlling such a powerful beast.



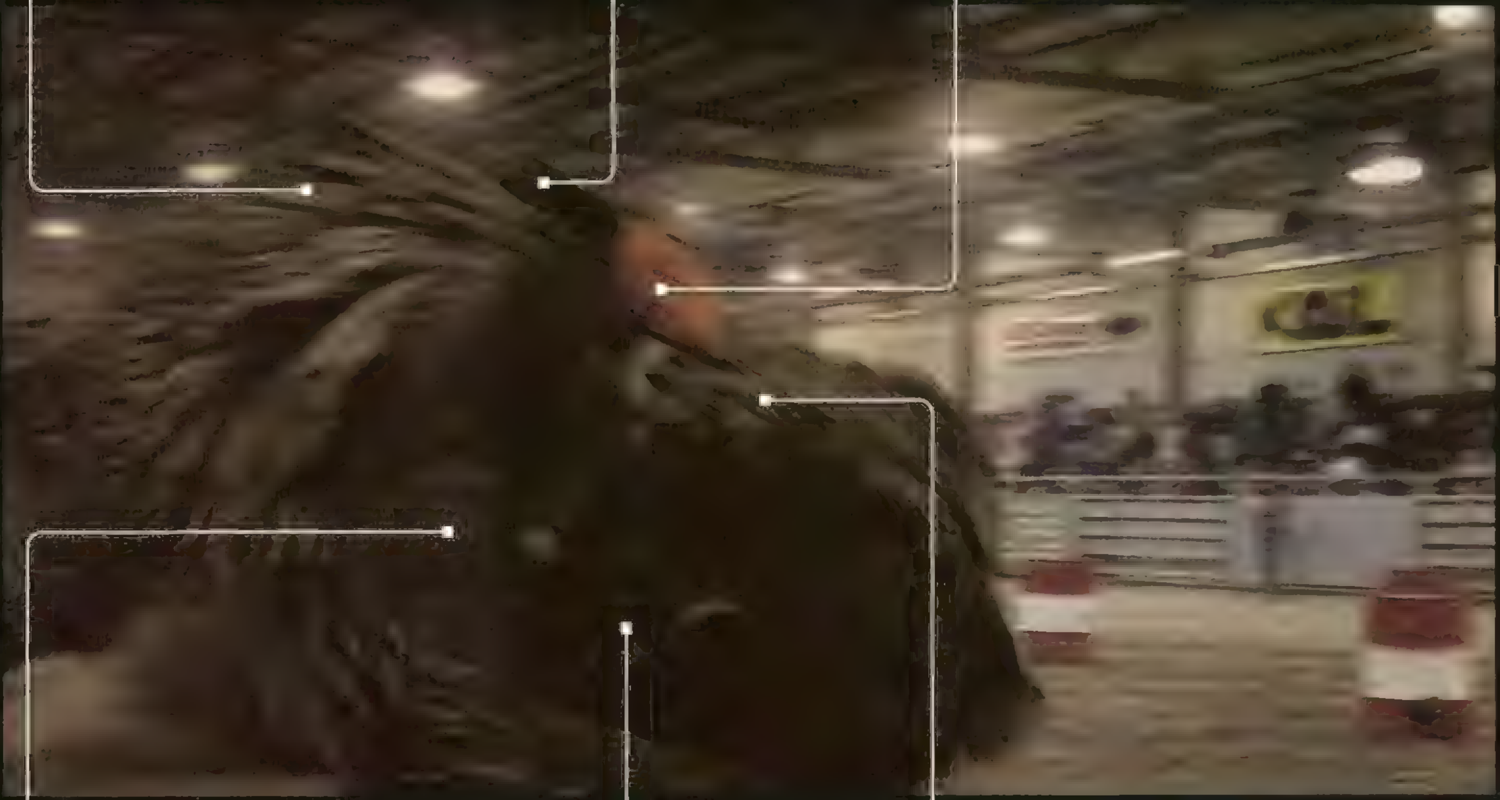
IN FOCUS | Yee Haw – The secrets behind Framestore CFC's bucking bronco



01 "The guy who built the rig was a real creature expert, having previously worked on *Walking With Dinosaurs* and *The Lord Of The Rings*," says Co-CGI Supervisor Jake Mengers. "Most of the rig is pretty much built from scratch."

02 "For every dynamic hair on the creature, the surface was filled with between six and ten passive curves, which cut down simulation times and helped a great deal with the grooming process," says Technical Director David Mellor.

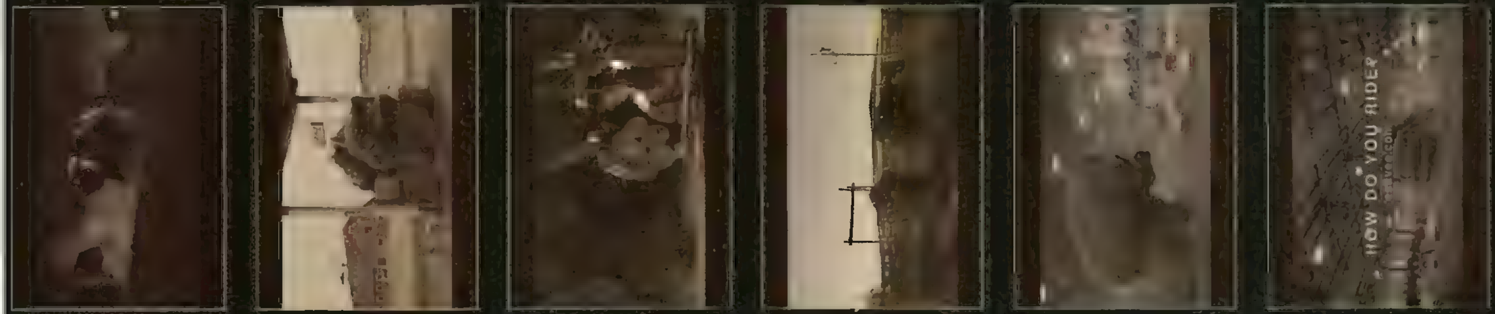
03 "The trick is to mark the keyframes where the bronco goes up and down," says CGI Supervisor Andy Boyd. "Once you've matched the speed of the machine, then it's just a question of capturing the turns at the right moment."



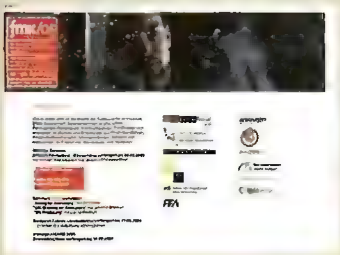
04 "Lighting PFX strokes can be tricky," says Boyd. "They don't react to light like normal geometry and, often, using a very simple lighting setup will achieve the best results: three directional lights all casting shadows was best here."

05 "We normally shoot Environment maps and a white ball when we light the shot," says Mengers. "'Esuvee' was unique in that we had a big hairy ball instead of a white ball, and didn't use Environment maps."

06 "With a full body of hair showing, a 100-frame run cycle easily took 60 hours to simulate," says Jake Mengers. "Sometimes this doubled when we had to bump up the number of iterations to prevent stretching."

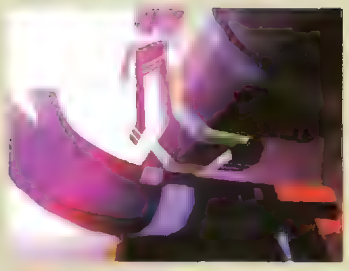


EVENT HORIZON



FMX/05, 27-30 APRIL, STUTTGART, GERMANY

Germany's tenth annual fmx conference has plenty of 3D fare from the converging worlds of TV, games and film. Disney, DreamWorks and Animal Logic will all be speaking.
www.fmx.de



ONEDOTZERO9, 27 MAY-5 JUNE, LONDON

There's still time to take the afternoon off and head over to the ICA for this year's fix of essential digital experimentation from onedotzero. The show's line-up presents inventive work from all facets of animation.
www.onedotzero.com

VISIONFEST 2-5 JUNE, INDIANAPOLIS, USA

VisionFest is the only festival in North America devoted to students, and aims to foster future creativity in animation by offering 'opportunities to network with industry and fellow visionaries'.
www.visionfest.org

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www.sohoshorts.com

3ds max 7.5 arrives

SOFTWARE Discreet releases version 7.5 of 3ds max, adding a new built-in hair and fur solution, mental ray 3.4 integration and visualisation tools from VIZ. Will it keep the customers satisfied?

Hot on the heels of Alias's recent upgrade of *Maya* to version 6.5, and coinciding with GDC 2005, Discreet has announced a subscription upgrade of *3ds max*, to version 7.5. Chief among the features included is a new hair and fur simulation system. Based on Joe Alter's legendary *Shave and a Haircut*, the solution offers styling tools which can handle complicated contours and optimised *mental ray* rendering using the native *mental ray* hair primitive. Elsewhere, *max*'s design visualisation tools have been supplemented with new features from, and integration with, *Autodesk VIZ*, such as Scene State, while the latest version of *mental ray* enhances rendering power.

All in all, while there's nothing to make the hair (or fur) on the back of your neck stand on end, it's still a progressive upgrade. Yet, in light of the muted reception for *Maya 6.5*'s perceived lack of 'hero' features, is it becoming unreasonable to expect pathfinding new featuresets every time a developer announces an upgrade? "The recent release of *3ds max* added the entire *character studio* functionality and unrivalled Normal Mapping workflow," pointed out Discreet's Nick Manning. "During the last few months, the development team has grown considerably, and now includes Dr Michael Girard and the team formerly of Unreal Pictures. I don't think the recent track record indicates the days of introducing swashbuckling new advances into 3D software are over. In fact, the games industry (where *3ds max* still reigns supreme) is pushing new innovative technologies more than any other industry."

Architectural visualisation is another sector that *3ds max* continues to cater for, responding to what Manning identified as "far more sophisticated" uses of 3D technology. "The industry itself has changed. No longer is visualisation viewed as a side project for a few specialists, if it ever was. We see integrated compositing, the use of cel shaders, 3D people and crowds, accurately lit interiors, all delivered in professionally edited and encoded media. Discreet has architectural customers creating material to rival that of many high-end post-production facilities."

Hair of the Gopher: *3ds max* was used in the production of Blur Studio's excellent Oscar-nominated short film, *Gopher Broke*

And, talking of sophisticated technology, the spectre of next-generation consoles is already influencing Alias, whose *Maya* upgrade makes specific provision for handling the anticipated 'giant leap' in complexity of in-game 3D. Is *max* similarly future-proof? "Absolutely," says Manning. "Discreet is working closely with the console manufacturers, and many leading developers have already validated their next generation pipelines around *3ds max*. These pipelines are already built with games underway."

3ds max 7.5 is available for £2,695. Visit the Discreet website for more information on its features.
www.discreet.com/3dsmax

Production line

The month's other releases in brief

TURTLE 1.1

Illuminate Labs has announced the 1.1 upgrade to its *Turtle* renderer for *Maya*. It's faster and easier to use, and enhancements include Subsurface Scattering, better antialiasing and improved baking, along with multi-processor support.
www.illuminatelabs.com

DOSCH HDRI

Dosch HDRI: Industrial Reflections is a new collection of HDRI environments for metal, glass, car paint and other industrial materials. The 60 high-quality HDR images of various technical reflection effects are provided in most formats, and cost $119.
www.doschdesign.com

SILHOUETTE ROTO

Silhouette Roto, the debut product from Silhouette FX, is a rotoscoping plug-in for *After Effects* (the Mac version is compatible with *Final Cut Pro*). *Silhouette Roto* offers Beziers, B-Splines and tools for drawing, reshaping, and transforming shapes. See the site for more info.
www.silhouettefx.com

MAGIC BULLET

Red Giant Software has released *Magic Bullet Suite 2*, a collection of 18 *After Effects* plug-ins. The application aims to deliver a complete production pipeline for processing digital video footage for output to DVD, TV, or film, and costs €425.
www.redgiantsoftware.com

Product preview

Antics Pre-Viz enters stage left...

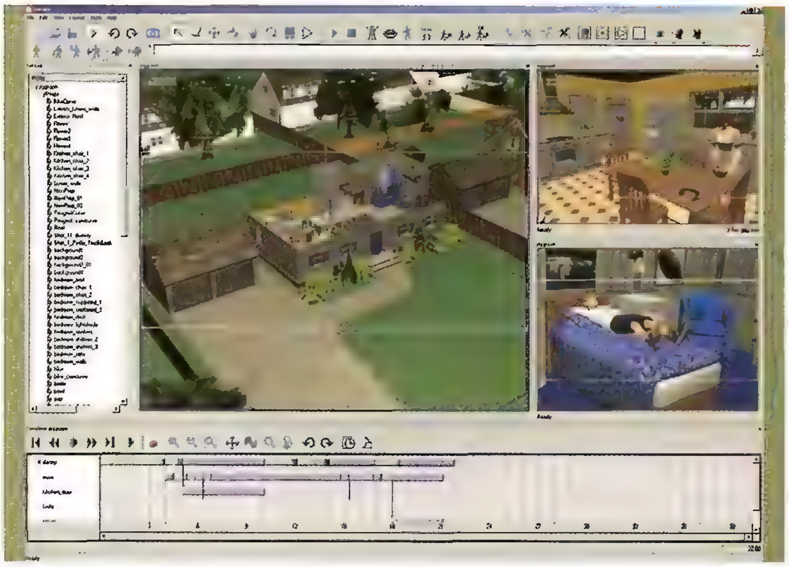
Antics Pre-Viz, a new real-time previsualisation application for filmmakers, aims to rewrite the rules for conceptualising film shots. What's the story, we asked Antics Technologies' Mark Burton?

3DW: ***How - and why - did*** **Antics Pre-Viz** ***change conceptually throughout its development?***
Antics evolved out of a research project which initially focused on the AI, non-linear aspects of animated simulations. Once the core architecture was developed, it became apparent that we had a real-time chaining, blending and layering 3D animation system. While this doesn't have the capability to produce high-end animation of the likes of *Maya* or *XSI*, we could make animation in a fraction of the time, and offer the ability to make changes *in situ*.

3DW: ***How did you settle on a happy medium between an adequate feature set and 'approachability'?***
There's not so much of a trade-off issue between an adequate feature set and approachability as you might think, largely because *Antics Pre-Viz* is a real-time system and, as such, it's possible to drive a whole raft of functionality interactively, direct from the GUI icons. A lot of what you do is WYSIWYG, which makes the process engaging to start with. We've focused on simplifying and radically speeding up the process of creating animation. We don't have a modeller (other than a primitives generator in the Construction Kit) but we provide rapidly expanding character and asset libraries that provide drag-and-drop, ready-to-go content straight to set.

3DW: ***Was there anything you agonised over before omitting?***
Yes - an integrated timeline. This would allow users to create and edit action within the program, using a timeline within a single module. We just didn't have time to get this exactly as we want it, and it's hugely important that we do get it right, as it forms the basis around which we're now developing the product.

3DW: ***How 'intelligent' are your virtual actors, and how intelligent do they really need to be for workable pre-viz?***
In one way they're the least intelligent things on the set; they just walk and go where you tell them to go. It's the props that instruct the characters how to interact with them, whether it's a door, a gun or a teacup. It would be virtually impossible to give a character an instruction set to deal with every object he's likely to encounter, but when that instruction set is contained within the props he interacts with, he can do whatever he's told to do. A character is effectively as good as the prop he meets, and that's what you need to make an environment useable for pre-viz. How intelligent they *need* to be is a good question. We take the view that the user must be the director, and in total charge of outcomes. The intelligence we offer is just enough to facilitate fast workflow efficiency, rather than to generate AI.



ABOVE Version two of *Antics Pre-Viz* will incorporate an integrated timeline to speed up the process of creating work

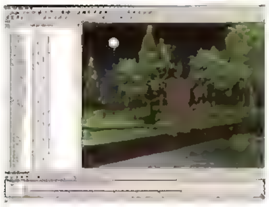
3DW: ***Would it be fair to say that*** **Antics** ***is going to be an ideal tool for visualising some shots, and not so suitable for others?***
I agree, and would say our real forte at this early stage is ultra-fast set design and initial shot set-up for first-stage visualisation. More complex action and detail can be achieved dependent on how much time you have, but we're all about speed and getting the first ideas moving. As the product develops, we'll be expanding its capabilities, and becoming of increasing relevance to the more specialised areas of production pre-viz. Two distinct areas for which we might not be the best tool for the job come to mind: crowd scenes with random and intricate character interactions, and intricate and 'close-up' character interactions, such as fight scenes and dance routines.

> "I BELIEVE 3D ANIMATION WILL UNDERGO RADICAL CHANGE BY THE END OF THE DECADE."
> **MARK BURTON, ANTICS TECHNOLOGIES**

3DW: ***How did you decide on the price?***
The value of pre-viz is hard to determine - it's too new a process. The price was therefore arrived at after a lot of discussion in the marketplace, but in the final analysis the cost has to be easy to justify - and $995 (£570) was a comfortable level for the majority of people presented with it.

3DW: ***Do you expect to see more applications entering into this marketplace in the near future?***
Without a doubt. There's *StoryViz* of course, and products such as *FrameForge 3D* are adding animation to their pose-type functionality. *SketchUp* is doing the same, but approaching from the geometric construction angle, and there are others. Pre-viz is starting to become a recognised value-add, and is perhaps one of the last processes to be addressed by bespoke tools in film production. I believe 3D animation is going to undergo radical change by the end of the decade, and real-time interaction will become the norm.
www.antics3d.com

Mark Burton is VP of Sales & Marketing for Antics Technologies Ltd



Antics Pre-Viz grew out of research into AI, but changed track to become an animation solution focused on speed and aimed squarely at filmmakers

An extensive mo-cap library that can be applied to characters in a simple step reduces the need to 'get dirty' animating, but a form of pose-based keyframing is available

● Each of these Sony *Trona* characters is intended to represent both a particular emotion, and a unique selling point of a range of Sony products

Sony's Trona project

ANIMATION Sliced Bread creates animated series for Sony – at top speed

Meet the 'Tronites' – five critters running riot on the My Sony magazine website, as stars of a series of 30-second animations produced by UK company Sliced Bread Animation. The original Trona character designs and storyboards were created by Austrian Senior Designer and Company Director Christina Vilics, based on the understanding that they needed to work on the web and appeal to adults and young adults alike: the Trona animations take the theme of 'challenging the grey matter', as viewers are introduced to the idiosyncracies and distinct personality traits of the various characters.

3D World asked Sliced Bread how it's managing to create 24 weekly Trona episodes in record time. "In the beginning, it was very difficult for us as we had to consider the long-term objectives of the whole project," says Jamie Denham, Project and Company Director. "In the initial stages, we commissioned the creation of bespoke tools to assist us, like a referencing system, character panel and animation transfer so we can import, export and re-use animation; basically, anything to make the animators work easier and faster!"

"Each episode only tends to have the character and a featured product set within the Trona landscape," adds Denham. "Careful planning with storyboards and scripts and animatics also helped. Really, render time is our only constant battle – we use *mental ray*, which has much longer render times than the usual *Maya* software renderer."

Visit Sony's website below to follow the episodic antics of the Tronites, or visit the Sliced Bread site for more on the creators.

www.sony.co.uk/trona; www.sbanimation.com

● Meeting the strict *Trona* deadlines has been aided by Sliced Bread's mysterious 'Czech rigger', who created tools to assist workflow

● Visit Sony's UK website to view a new animation every week until May 2005, and to check out the archive of *Trona* movies

Letter from Hollywood

Canada rules the world

Craig Zerouni, Production Consultant at Side Effects Software, goes to Hollywood in search of its foundations, only to find they're much more northerly than you'd think

The second largest export industry in the USA is Entertainment; specifically, film and television. That in itself is somewhat amazing, but a more amazing thing is this: feature films in general, and in particular the big effects-laden blockbusters that export so well, are almost completely reliant on the products of two tiny Canadian companies. That's right: without Alias and Side Effects, not many effects-driven feature films would get made, at least in the short term.

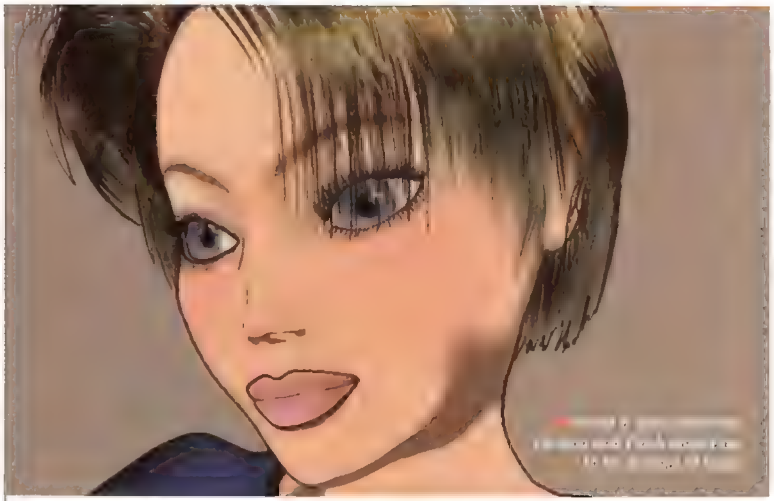
At first glance, this seems incredible. Imagine what would happen if Boeing, spiritual leader of America's number one export industry (aerospace), were to find that it couldn't build aircraft without the efforts of a tiny company in Guatemala.

Yet it seems doubtful that any similar thinking has ever gone on at the Hollywood studio level. Does Sherry Lansing, head of Paramount, understand the degree to which Paramount's films are potentially held hostage? Are they losing sleep at Warner Brothers, wondering what would happen if *Maya* and *Houdini* were to be bought up and stockpiled by someone like, say, Rupert Murdoch at Fox?

Naturally, these are rhetorical questions. Of course they don't think about these things. But should they? After all, we're talking about billions of dollars of worldwide income, leveraged off the backs of two companies whose total value might barely reach $100 million. I pointed this out to someone, who observed that another way of looking at this was that Hollywood bought some fairly cheap software from Canada as 'raw materials', and turned it (along with some relatively expensive labour) into billions of dollars in revenue. So who was zooming who? And that's an excellent point. Maybe it's a cunning studio plan to leverage themselves off of Canada's willingness to give tax breaks not just to production, but also to the tools of production.

Still, it's interesting to speculate on what might happen if someone were to attempt to exploit this tiny foundation to Hollywood's mighty edifice. What if someone were to try to corner the market in high-end 3D software? In the short term, we'd be back where we started, with a short list of companies with their own software that could step in and fill demand. ILM, R&H, Pixar, to a lesser extent Blue Sky, and probably someone French, would all be in a great position, at least temporarily. But even most of them still rely to some extent on outside software as well, though not necessarily *Maya* and *Houdini*. Other large players, like Sony, Digital Domain, and Weta, would have a bigger problem, though of course the software they already have would continue to be used; expansion, however, would be impossible, at least for a while.

But in the longer term, the 3D cat is well out of the bag. *XSI* would presumably suddenly become much more attractive, and *LightWave*, which is used a fair bit, would definitely have a big coming-out party. Maybe the people who commission these effects shots have already worked this out. I mean they're always planning ahead, carefully steering their studios and this industry through the uncharted waters of the future. Aren't they?



POSER 6 ARRIVES

NEW RELEASE Curious Labs has released its long-awaited Poser update, offering new human figures, Ambient Occlusion and Open GL previews

IT'S BEEN TWO long years since *Poser 5* appeared for the PC, but for the app's huge fanbase, the wait is over – *Poser 6*, for Mac and PC, shipped on 21 March. So how much of the last two years since *Poser 5* on the PC has been spent updating core features? "Our user base was pretty much split between new features and improving existing features," said Uli Klumpp, Poser Product Manager. "Mostly, we let the surveys decide. So, OpenGL preview was a top requested new feature, and more photorealistic rendering was a top request for improvement. Of course, we did add some treats as well, such as my favourite, the Shadow Catcher."

Poser 6 also features new figures (called James and Jessi), improved cartoon rendering, *Flash* support, and workflow improvements. But Klumpp believes OpenGL for accelerated previews will be particularly welcome. "People should also be really pleased with Ambient Occlusion rendering for soft shadows, and the new level of realism they can now achieve in *Poser*." *Poser 6* costs £157 / $249 / €229.
www.curiouslabs.com

Donkey wrong...

According to a recent BBC news story, vets are warning that the *Shrek* movies are indirectly responsible for the neglect of hundreds of donkeys, bought because of the film's loveable ass, voiced by Eddie Murphy.

Peter Jinman, a former President of the British Veterinary Association and a practising vet, told BBC Radio 4's *Farming Today* that "more donkeys were appearing," and that the so-called '*Shrek* effect' could not be denied. He also likened the donkey-owning craze to previous stampedes to own 'vogue pets', such as llamas and ostriches.

3D World would like to warn anyone who's seen the *Shrek* films and is contemplating purchasing a donkey for real that, while they are indeed an endearing pet, they need a lot of land, and a lot of care and attention. We'd also like to point out that THEY CAN'T F*CKING TALK! IT'S JUST A CARTOON, YOU UTTER MORONS! Adopt a donkey at **www.thedonkeysanctuary.org.uk**

MeNTaL RoY

Having spent 40 hours without a break lip-synching a talking squirrel, resident columnist **Mental Roy** is pleasantly surprised to discover that filmmakers and DVD producers are finally paying visual effects the respect they deserve...

WE WANT TO SEE AN ACADEMY AWARD FOR BEST SUPPORTING VFX SUPERVISOR

A FAMOUS ARACHNID study concluded that if you give a spider marijuana it'll spin a reasonable web, but lose interest. Give it amphetamines, and the spider will model a web quickly, but leave huge holes twirling in its wake. Give a spider caffeine, and it'll find the task more difficult to concentrate on, whereas if you give a spider LSD, it'll take ages, but produce a beautiful, silky, shimmering web. Give a spider *SoftimageIXSI*, on the other hand, and what will it make? It'll make f*ck all.

So what can we conclude from this? That 3D is more difficult to get your head round, and more disorientating, than many narcotics. Yet this year's winner of the Achievement in Visual Effects Oscar has indirectly shown that film audiences may at last be developing an interest in how their films were really made.

Now you'd have to have been bitten by a particularly radioactive spider not to have predicted that *Spider-Man 2* would win its Oscar: but with great visual effects power comes great responsibility. And if you check out the special features on the *Spider-Man 2* DVD, you'll find an almost-complete technical story of how the film's special effects were done. Wow. Could it be that DVD extras are out of their ghetto? Could it be that Hollywood has finally admitted CG exists and contributes to a film's success?

Because for a while there, if the 'Making Of' documentaries you'd find on the average DVD were anything to go by, Hollywood seemed to be making a concerted effort to return to the silent film era – hiding the mode of construction of film from the average viewer, and trying to convince us all that what they were spinning was a form of magic that we'd never understand. A mere handful of years ago, every behind-the-scenes, on the set, 'making of' DVD documentary would resolutely ignore how the 3D was done. The standard interview with the Geeky 3D Guy on your average DVD's special features used to last about a nanosecond, and featured a light-sensitive blinking bloke with a baseball cap pointing at a 3D mesh rotating like a screensaver, while the presenter desperately attempted to dumb everything down and keep it zany for the Beavis and Buttheads back home, whose Cola-fuelled attention span was already beginning to waver.

<RED ALERT – podgy 14-year-old DVD consumer Johnny has turned his bored gaze back to his Happy Meal RED ALERT his brain has been overloaded by that brief technical insight into the special effects creation process RED ALERT for crying out loud, will someone stick a Doc Ock toy in his chubby fingers RED ALERT how was this allowed to happen RED ALERT>

At which point they would've cut from that Geeky 3D Guy and back to Kirsten, who'd look *gorgeous* while she told us how spiritual it was to stand next to a bluescreen talking to a series of imaginary 3D effects for an hour or two. Then it'd be on to how she and all the other actors really had a BLAST as they collectively contributed 18-19% of the blockbuster's actual screen time, filling in the gaps between the VFX set pieces before zipping off to Rodeo Drive to get matching Columbia Pictures logos henna'd onto their lower backs to show how MUCH they like BONDED, dude. Well thank God this is no longer the case. There's still magic in those hills: it's just been conjured up in post.

In fact, there will come a day when we grow tired of seeing the actors at all: we want Oscars for Best Supporting Visual Effects Supervisor, or Most Convincing CG Cow Rotating in a Whirlwind, goddamnit. So let's hope DVD extras like those on *Spider-Man 2* are the rule and not the exception. Because, apart from anything else, they're raising awareness of the secret life that people like us lead in our darkened rooms at visual effects studios. And that's good news for *you*, 'cos it'll stop people's eyes glazing over at parties when you tell them what exactly it is you do in films.

A fish through plasma

[illegible] The Continuum Group creates a glimpse of a rare prehistoric fish for a Hull museum

A new CG exhibition at The Deep museum in Hull offers visitors the spectacle of an extremely odd prehistoric fish in an underwater environment, thanks to visitor attraction specialists, The Continuum Group.

The coelacanth species is over 400 million years old, and its discovery in 1938 was dubbed the century's most important zoological find. Now one of the world's most protected animals, the CG strain of the species swims on three large plasma screens at the back of a huge water tank: Continuum's reconstruction shows how the fish rotates as it swims using unique limb-like fins. "It really is a bizarre fish. It has one of its fins on top, and it looks like it's waving at you as it moves," says Richard Briggs, Multimedia Director at Continuum Group. "We had to get under its skin, and since we were going to model it we needed to know everything about it. The modellers did the research element as well."

3ds max was used for all the modelling and animation, and *V-Ray* was used for the rendering. Because the fish will be seen through water and in a simulated deep sea environment, these factors dictated how much animation was necessary. Visit the CG coelacanth at The Deep (www.thedeep.co.uk).

www.continuum-group.com

The Continuum Group modelled and animated a virtual coelacanth for The Deep, a Hull-based charity and museum

the state of the indu

BY MARK HAMSHAW

Workers of the 3D world, unite – and arm yourselves with our overview of working hours, salaries and pay security within the CG industry. How does your own job compare?

Knowledge is power – and rarely more so than when negotiating your working conditions. This statement applies equally to each rung on the 3D career ladder: whether you're a student wondering in which part of the industry to specialise, a first-timer facing an uncompetitive salary offer, or an experienced professional fearing that to switch studio may merely to be jump from the frying pan to the fire, an awareness of the alternatives is vital.

But how do you go about gaining this awareness? Word of mouth only goes so far, particularly when making such life-changing decisions as which field to train in, or whether to move from one side of the Atlantic to the other. What is required is a global overview of working conditions in each primary sector of the 3D industry: animation, visual effects, game development and architectural visualisation. This article is intended as a first step towards that overview.

Over the next six pages, we will be examining three topics central to the working conditions of employees in the 3D industry: job security, rates of pay, and the average length of the working week. Some of our evidence is, inevitably, anecdotal. But, where possible, we have also drawn on the available sources of hard data: the long-established Roncarelli Report, the findings of newer market research companies like Digital Vector, and user surveys conducted by online communities such as CGArchitect.com.

The results, although far from a definitive statement on the subject, are striking. If you're a games artist, did you know that you could improve your earning potential simply by relocating to Europe from North America? Or that an architectural visualisation professional with similar job skills and software experience probably earns around one and a half times the salary that you do?

If not, you should read on. As a series of well-publicised recent legal cases attests, 3D professionals are increasingly unwilling to endure poor or unequal working conditions in the name of their art. Even without resorting to such drastic measures, knowledge of 'normal' working conditions throughout the industry will empower you when negotiating a competitive salary. And if you can't change the company for which you work single-handedly, you can at least leave to find a better one.

Illustration by Sean Rodwell

Security of employment

Who cares how exciting the work is or how great the perks are if the job isn't built to last? Here, we examine whether job stability really does exist for artists and animators

While issues of pay and working hours are a day-to-day problem for many in the 3D industry, it's the fear of unemployment and job instability that causes long-term worry. But the reasons for such insecurities, and the challenges facing artists and animators in each discipline, are very different.

The architectural field is undoubtedly the one to aim for by those looking for a stable working life, not least because it continues to expand at an impressive rate: "Architectural illustration is the fastest-growing segment in the CG industry, and is expected to be that way for a number of years to come," says Jeff Mottle, founder and CEO of community portal CGArchitect.com. Robi Roncarelli, President and Publisher of PIXEL (www.pixelnews.com), home of the Roncarelli Report, also believes this field has much to offer: "From my experience, the architectural area is the most stable, just because of the nature of the work involved and how the jobs develop."

> **"There's a lot of flux in the games industry, and the UK has been particularly bad in the last two years."**
>
> [illegible]

Kam Memarzia, founder of architectural visualisation agency PlayGen, is a little more cautious. He suggests a lull in construction work has resulted in a corresponding dip in the amount of visualisation work currently available: "There really aren't many industries where the long view is now possible, especially one such as visualisation, where the bar is raised on a yearly basis. But there'll always be work for visualisers who know their trade and can keep up with the competition. It's the fittest and best who survive."

Roncarelli says that, while they're less of a sure bet, the movie, broadcast animation and visual effects industries also offer a surprising amount of security. Although this field is notoriously highly competitive and deadline driven, he believes the commonality of technology puts the talents of the individual first: "The people who operate the systems are paramount, together with the production pipeline, which also depends on people to maintain it and keep it flowing," he says. "Staff are therefore important and, while there is turnover in the industry, it's often job-based – they're hired on a contract basis for a specific job, or series of jobs. This is a considerable generalisation, as the company sizes can vary greatly, but people are crucial to the success of the project."

Of course, the constant ramping up and scaling back of staff at many of the studios has made the industry one that's highly reliant on freelance and contract-based talent. And while the rewards can be generous, living job to job certainly isn't for everybody: "A lot of artists have a nomadic lifestyle, and it does get tiring," says Bret Culp, VFX Supervisor at C.O.R.E. Digital Pictures. "If you can offer someone a permanent position doing something they love they'll generally be happier."

Culp says that studios that are able to employ most of their staff full time (achievable at C.O.R.E. by allowing staff to shift through three studio divisions) reap additional benefits: "Typically, studios gearing up for a big production must take whatever talent's available at the time. By keeping members of staff in-house, the quality of work is assured, and you remove the learning curve associated with regularly bringing in new people."

By contrast, the games industry is something of a jobs minefield right now. Roncarelli suggests that this is because the push for ever more complex game content means development teams are more biased towards technology:

TALKING POINT | Job Security

"We're starting to see people working on a per-project basis in the games industry, although a massive overhaul of the business is required for it to become widespread. A games studio, focusing on just one title at a time, might need 100 members of staff at peak but, once a project ships, as little as ten might be needed for pre-development of the next title. What do you do with the other 90? Even with studios' development of multiple titles simultaneously, there are certain staff that are only needed for a portion of development time."

Jason Della Rocca, Executive Director of the International Game Developers Association (IGDA)

"The ability to define architectural visualisation tasks well in advance and the importance of continuity of production and in creating a rapport with designers and architects helps promote stability for positions both in-house and at third-party design facilities. In fact, most problems in the architectural field are caused by changes in design, either to accommodate a client's wishes or because of environmental issues that develop, and so on."

Robi Roncarelli, Writer and Publisher of the Roncarelli Report

"Architectural illustration [illegible] developers massive amounts of money in loan interest [illegible] they can make [illegible] properties and, while movies [illegible] comes and go, there are always [illegible] be built. So I'd say the visualisation industry is very healthy right now, with good job security. A survey I did early last year also indicated that the vast majority of the workers in the industry were pretty happy with their jobs and the work they do."

Jeff Mottle, President and CEO of CGArchitect

> **"In the UK, plenty of small game developers have gone bust outright, so one of the attractions of bigger companies has been a perceived sense of job security. But consolidation continues, so it still doesn't really exist."**
>
> OWAIN BENNALLACK, EDITOR OF DEVELOP MAGAZINE

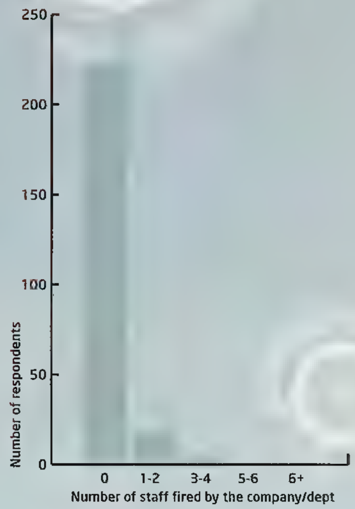
"To be profitable, a game developer must be constantly working on the next game or version: writing code, developing and adapting their game engine. As a result, workers are more like cogs in the machine, with individual members of staff not as important as the whole project."

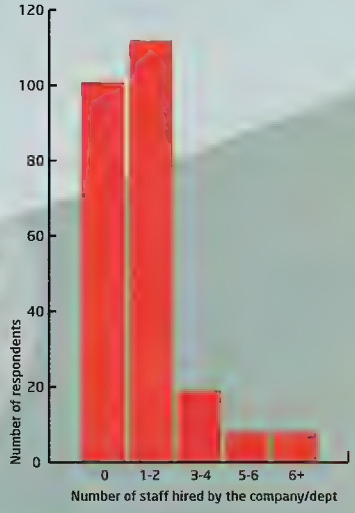
NOW YOU SEE THEM...

The last ten years have seen the rise of a few publishing giants and the disappearance of countless smaller publishers and developers. While the output has grown more conservative in an attempt to minimise risk and maximise profits, the industry has grown increasingly unstable, with the UK suffering the worst fallout: "Job security has all but vanished," laments British game artist Lee Garbett. "Over the past two years, companies that appeared to be the most stable around, have gone under." Although Garbett believes the maturing of the industry means casualties were inevitable, the continuing push for market share by the remaining studios can only further hinder creativity: "It's likely to result in larger companies playing it safe with sequels and licenses, and less likely to try new things."

Owain Bennallack, Editor of games industry trade magazine *Develop*, believes major changes in the way studios assemble their teams are a likely result of the continuing struggle for profitability: "The industry must decide whether it might make more sense to follow a looser, movie-style model, where the whole team works on a short-term contract." But Jason Della Rocca, Executive Director of the International Game Developers Association (IGDA), believes an adoption of the 'Hollywood production model' has already begun: "We're starting to see people working on a per-project basis, although there needs to be a massive overhaul of the business for it to become widespread." He points out that such a move makes sense to companies in the long run, given the ever-changing staff needs during a game's development cycle. A games studio, focusing on one title at a time, might need 100 members of staff for the bulk of the time but, once a project ships, as little as ten might be needed for pre-development of the next title. "What do you do with the other 90? Even with studios' development of multiple titles simultaneously there are certain staff that are only needed for a portion of development time."

And what about the workers? Like the movie and broadcast animation industries, it'll no doubt require people to accept a nomadic lifestyle. But there are certain benefits: "If you're talented, then you'll always be in demand," says Della Rocca. "In fact, the 'Hollywood' model should lead to a true supply and demand marketplace, where people are actually paid according to their resume."





IN NUMBERS | The safest market sector?

While it's always tempting to assume that the grass is greener in other market sectors, evidence suggests that for architectural visualisation professionals, the grass is not merely green, but laid out in a perfect lawn. This recent poll of the number of job changes in the company/department of over 200 architectural professionals over the past 12 months (shown above) suggests that, for at least one part of the 3D industry, steady growth is the norm. SOURCE: CGArchitect.com user survey, March 2004

rates of payment

Every budding 3D artist or animator wants to turn their art into a profit, but with distinct hierarchies in place and animators at two a penny, do the numbers really add up?

A passion for 3D goes a long way, but anyone who's serious about a career in videogames, visual effects, animation, or visualisation ultimately needs to think about the bottom line. A good and fair wage is essential to long-term job satisfaction. It's crucial to appreciate the different accepted pay scales and other variations associated with each particular 3D niche - although, in parallel, each person's abilities (and talent for negotiation) will naturally have an impact on typical pay and how their salary changes as their career progresses.

It's the games industry - the youngest, least mature, and arguably least specialised area - that initially appears the least attractive: "It's still at the bottom of the remuneration list," agrees market analyst Robi Roncarelli. "No disrespect intended, but other than the few well-paid games ideas creators, it's still basically a 'geek'-oriented business, and geeks, other than those few who come up with great ideas and form their own successful companies, are generally not high on the pay scale." Games might be produced with higher budgets now, but those costs are being absorbed by the extra staff and extra hours required to produce more complex and realistic content. "There's still a distinct pyramid," says the IGDA's Jason Della Rocca. "There's no end to what people at the top can get but, at the bottom, you have the rank and file development, and there's no real sense that they're being rewarded except for the usual pay increases due to inflation."

> **"Although pay for architectural visualisation is naturally dependent on how good someone is, the real money – as ever – is in management."**

Develop magazine's Owain Bennallack isn't quite so pessimistic: "I'm reluctant to talk about pay in terms of specifics, as it all depends what somebody brings to the table. But, while they might start out on a salary of around £16,000 ($30,000), game developers can earn as much as £50,000 ($100,000). There is a potential for the best people to earn as much as they do in other areas of 3D."

While this may contradict Roncarelli's global data, European figures from research and consultancy firm Digital Vector do support Bennallack's, suggesting €20,000-28,000 for new animators ($27,000-37,000) and between €29,000 and €60,000 ($38,000-60,000) for senior-level animators. The firm even suggests these figures are typically 10-20 per cent higher than those given to animators in film and broadcast.

However, anonymous online campaigner 'ea_spouse' suggests that salaries can often be as dependent on a games studio's needs as the applicant's talents. "The specific figures that I've heard show a broad spectrum of starting salaries depending upon how much one negotiates, and how urgently a position needs to be filled. Some are shockingly low, while guru positions pay substantially more."

Those who view the animation and visual effects work for broadcast and film as a surer bet also need to be aware that here, too, the pay hierarchy resembles a particularly steeply inclined pyramid: "The highly specialised technical jobs are the premium ones, if you're after money," says C.O.R.E. Digital's Bret Culp. "There's only a handful of amazing *RenderMan* shader writers in the world, or people who really understand lighting. Conversely, everybody wants to be an animator, which means there's a glut of talent and, therefore, less money is offered for that role."

MONEY TALKS

In the world of architectural visualisation, there are three areas to consider, each with different typical scales of pay. CGArchitect.com's Jeff Mottle explains that in-house departments rank lowest, with better salaries available to employees at dedicated visualisation firms, and freelancers paid best of all: "Over the last ten years, the salaries have increased steadily, but I think this has had more to do with the maturation of the industry rather than a trend towards much larger pay increases," he says. "I don't expect salaries to increase much past where they are now."

TALKING POINT | What are you worth?

"From what I've heard of it, I'd say that architectural illustrators are paid significantly better for what they do than those in the games industry. As a junior entering the industry you can expect to make around the $30-35,000; an intermediate around $40-50,000 and then senior artists and production directors make between $60,000 and $100,000 a year. Freelancers can easily gross more than that, although there are significant overheads to consider."

Jeff Mottle, President and CEO of CGArchitect

"At Electronic Arts, there's a system for bonuses – of a sort. From the employee's side, they tell you that bonuses are merit-based and are distributed at a certain time of the year. Line managers will recommend a certain amount, and the studio heads will decide whether that amount actually gets paid. So there are, in theory, alternative compensation arrangements, but there are no rules to govern them, and no guarantees. I'm told that this situation is the norm in the industry; what varies are the ethics of the people writing the cheques."

Online campaigner 'ea_spouse'

"Bonus schemes, whether based on sales or for hitting key milestones, aren't uncommon [in the games industry]. Ten years ago [illegible] offered the potential to [illegible]. Nowadays a bonus might amount to 25 per cent of a person's salary. That may sound huge, but it's often in lieu of overtime, and so it depends on how many extra hours were worked to earn it."

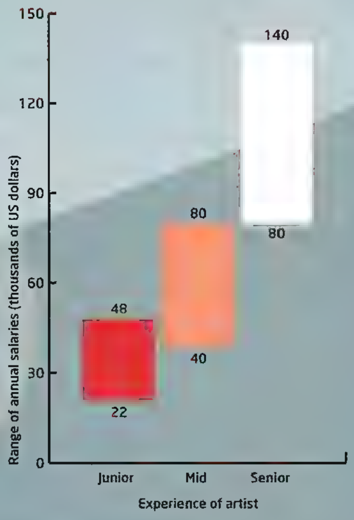
Owain Bennallack, Editor of Develop Magazine

> **"Computer animation and visual effects production pay more highly than videogame animation because the role of the individual is more important, and individual reputations and past work experience are rewarded."**

It's worth looking beyond basic salaries, as overtime bonuses and royalties all boost potential take home pay. But each territory has its own employment laws that can affect the local approach to overtime. Currently, the UK has no official rules regarding overtime, beyond what's set out in each individual contract. Canada is a little different, with a formalised system for overtime beyond a 40-hour working week. Then there's the United States, where workers are due time-and-a-half beyond the first four hours, unless they meet three criteria: they are paid a set salary and not by the hour, they earn at least $455 a week (or $23,660 a year), and their job qualifies as administrative, professional or executive. Those earning over $100,000 are exempt. It's the interpretation and implementation of this poorly defined federal law (along with conflicting state laws) for which the games industry in particular has come under fire.

Complaints about employees being coerced into working excessive hours have been snowballing for several years now, but it's only in the last few months that allegations about failure to pay for these hours has come to light. Electronic Arts has received particularly harsh criticism. Jamie Kirschenbaum, an ex-animator at the games developer and publisher, is currently bringing a lawsuit against the company for overtime compensation (www.eaovertimecase.com), though even more successful at drawing publicity to this issue has been an article posted online by 'ea_spouse' (www.livejournal.com/users/ea_spouse/), highlighting grievances with the company's overtime policy. While Electronic Arts has attracted the most negative attention, it's clear many studios, large and small, currently fail to adequately pay or compensate for overtime.

Bonus and royalty payments aren't quite so contentious, but they're even harder to offer guidelines for. One certainty is that games studios aren't as free and easy with the bonuses as they used to be: "For royalty or profit-share payouts, a games studio needs to actually make a profit. The majority don't see any money beyond what the publisher pays upfront," says Jason Della Rocca. But in architectural visualisation, Jeff Mottle notes that, while profit sharing is usually only given to management and senior-level artists, almost every company he's worked for has offered bonus and royalty schemes: "I don't think it matters what industry you're in, company pride alone doesn't go very far unless there's some incentive to work long hours and go the extra mile."



IN NUMBERS | How much are you worth?

How much earning potential does a 3D artist really have? The graph above shows the typical pay brackets for junior, middle-ranking and senior 3D artists within West-coast US computer animation studios in 2002/2003. The region is the most bankable for professionals in this market sector: salaries on the East coast are around 82% of those shown above; in Europe and Australia, around 76% of those shown above; and in Japan, just 57%.

SOURCE: The Ronacarelli Report on the Computer Animation Industry, 2003

hours and overtime

Long working hours may be acceptable to new talent, but as workforces mature, they crave stability. And, as the games industry is discovering, something's got to give...

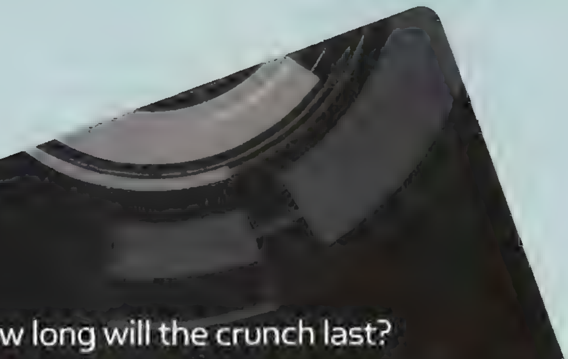
Everyone knows that the most creatively stimulating jobs are invariably the most demanding. Not only in terms of the talent required, but also in the amount of time and effort that must be invested to get results, be it career advancement or cold, hard cash. But just how much work should employers expect, how many hours are acceptable or right, and what are the immediate rewards or compensations given to those who go the extra mile? These are the factors that determine whether all that extra work is really worth the effort.

Architectural visualisation professional Kam Memarzia suggests that, with proper management techniques in place, the lot of an architectural CG artist needn't be an overly harsh one: "In six years of running visualisation teams, we've worked on over 100 projects, but only worked overtime on half a dozen occasions," he reveals. "If you schedule correctly, and keep changes to a minimum, then it all works well."

CGArchitect.com's Jeff Mottle isn't so sure. "Fifty hours a week is pretty much a given, no matter whether you work as a freelancer, in-house artist or for a visualisation firm. Near deadlines, working 18-hour days and all-nighters without sleep wouldn't be out of the question either. I've worked many 80-hour weeks." He suggests that architectural projects can easily spin out of control near the end, with clients requesting eleventh-hour changes, or short deadlines pushing teams to work excessive hours: "All of us do our best to keep a short leash on these types of clients and expectations but if you want to be competitive in this industry, working long hours and under extreme deadlines is something you come to live with."

In the visual effects and animation industries the general rule is that the larger the studio, the less likely they are to drive staff to work excessive hours. C.O.R.E. Digital Pictures is one studio that prides itself on low staff turnover, attempting to avoid pushing staff to work overtime whenever possible. "When we started out as a small company, we worked until the job was done then took a day off. But now I understand the need for overtime policies," says VFX Supervisor Bret Culp. "An efficient pipeline and good production management play a big part in our ability to avoid inflicting long hours. But not many of the smaller studios can adopt these practices. Some places work their teams really hard, and have a very high staff turnover as a result."

Smaller studios are also likely to work on shorter-term projects, increasing the number of deadlines in any given period, and thus raising the likelihood that staff will need to work extra hours. "With commercials work, you have so many people who all have a say, and the nature of the job makes it impossible to pre-empt all eventualities and closely manage each project," says Soho industry veteran Andrew Daffy. He does point out that the trend towards specialising in the effects and animation industries makes it possible for people to



IN NUMBERS | How long will the crunch last?

Each area of 3D has its own set of variables that help determine working conditions and the amount of overtime necessary. With scheduling, it's generally accepted that movie effects or animation work and architectural visualisation are easier to map out than broadcast jobs. Most notoriously hard to quantify of all are videogames. Team sizes, project durations and the amount of time spent in 'crunch mode' are all useful additional indicators, though. Here's a rough guide of what to expect.

	[illegible]	[illegible]	[illegible]	[illegible] VISUALISATION
[illegible]	[illegible] people	[illegible] people	[illegible] people	[illegible] people
[illegible]	[illegible] months	1-[illegible] weeks	12-[illegible] months	[illegible] weeks
[illegible]	4-8 weeks	1-2 weeks	[illegible] 9 months	[illegible] 4 weeks

TALKING POINT | Working nine to five a.m.

"When there's enough talent to go around, people can afford to be a little pickier and fight for fair working conditions. But if the job market is tight there's less opportunity to make a stand. There's always going to be someone who's just as talented but more desperate. At least freelancers are better equipped to deal with studios that push their staff too hard. They can simply choose not to go back when the contract runs out."

Tim Miller, CEO of Blur Studio

"The games industry mixes the worst of both worlds. There's the technical element that exists in other software industries, but then there's the creative side, and the inherent instability of a hits driven economy. It's like trying to make a movie and invent the cameras to shoot it at the same time. And there's also the perennial problem of an expectation gap. People come into the industry thinking they'll have fun, and are shocked to find that the work is extremely demanding and that they're just a small cog in a big machine."

Owain Bennallack, Editor of *Develop* Magazine

"Soho's commercials scene is a little different to the film world. With the kind of deadlines you're faced with and the calibre of work required, you can't avoid long hours. With a commercial you have so many people who all have a say, so it's not simply about making something on a production line. Ultimately, you only ever get the good jobs by putting the hours in. It is possible to structure things so that people leave the office at a reasonable time. But you won't produce work with that 'wow' factor. And it's those jobs that will develop your career."

Andrew Daffy, freelance commercials animato

> **"Videogames are still a little less sophisticated, so the studios can get people fresh out of college and pretty much abuse them. In our industry, artists just won't put up with that crap."**

lesson the impact of deadlines: "You can put yourself in a role where the hours are more contained. Modellers or riggers don't tend to need to put in all-nighters, whereas lighting and rendering people do."

WHEN IT COMES TO THE CRUNCH

In addition to highlighting the lack of payment for overtime, 'ea_spouse' also emphasises a trend for long shifts that stretch way beyond traditional deadlines. Many companies push their staff to work 'crunch hours' - anywhere between 70 and 90 hours a week - for months on end, a phenomenon sometimes referred to as 'perma-crunch'. "There have always been harrowing days or weeks of crunch associated with delivering a project," says 'ea_spouse', but the projects are substantially bigger now and some of the larger companies are convinced that they need to complete a production cycle in one year. That leads not only to brutal crunch times within their own studios but also puts pressure on smaller studios to compete."

Large companies are the worst offenders, says 'ea_spouse', in part because they lack the close contact between upper management and employees, which deters disrespect: "Quite a lot of the blame resides with management practices, but that really doesn't mean the blame resides with the managers. The majority of the problem has to do with expectations, and a lack of control over the measures a company can take when mistakes are made. The managers pay for the mistakes made at the executive level and the developers pay for the mistakes made at the management and the executive levels. It reminds me of that saying about refuse rolling downhill..."

Much of this, says Della Rocca, is down to the promotion of staff to managerial positions: "They'll often have no formal management training or experience, and no idea how manage teams up to 100 and budgets of $5 million." He suggests that games companies also need to start thinking beyond one project. By pushing staff to work long hours for extended periods, people will either end up off sick or simply leave: "There are larger companies that turn-over half their staff every other year. With the effort they put into hiring and training, they're effectively throwing away that investment."

Worryingly, a Quality Of Life Survey carried out by the IGDA revealed that half the workforce in the games industry plan to leave within the next ten years. "People are coming into the industry full of energy and passion, working on a couple of games and then leaving because we're burning them out," says Della Rocca. "More humane working conditions and a more structured approach to business management would lead to happier workers, better products, and more successful businesses. Crunch time is actually a useful production tool when used intelligently. If you work normally and then put in two weeks with extra hours, you'll see a spike in productivity and morale. But managers have no clue how long a project will take, so they just pile on the hours." 'ea_spouse' has no definitive answer to the problem, but argues that there should be a universal change in attitude throughout the industry and that the change must come from above: "I don't think the way forward is absolutely clear to anyone, but we need better managers, better standards and better expectations for what can reasonably be accomplished with a certain team in a certain amount of time. We need to realise the total and utter stupidity of working people into a delirium of exhaustion. Before we can get that, we need a desire for change, and a genuine commitment to it from those in control. That's the beginning." ●

FURTHER INFORMATION

- Digital Vector
  [w] www.digital-vector.com
- CGArchitect.com
  [w] www.cgarchitect.com
- IGDA
  [w] www.igda.org
- The Roncarelli Report
  [w] www.pixelnews.com

TUTORIALS

TECHNIQUES / TIPS / TRADE SECRETS

REALFLOW

liquids in motion

You don't have to work at ILM to create realistic fluid simulations. Discover how to use the evaluation version of RealFlow 3 on this issue's CD to animate the aqueous character on the right

BY DARREN D'AGOSTINO

One of the hardest things to recreate realistically, in the world of CG, is the movement of fluids. Running water, fire, smoke and dust and are all good examples of this. What makes them so difficult to simulate is not only the complex way in which they move, but also the huge number of interactions between the individual parts of the system.

A few years ago, the only way to create such effects was to use custom simulation tools developed in-house by major studios. But, fortunately for those of us without million-dollar R&D budgets, there are now simple, affordable, off-the-shelf solutions that can achieve the same results.

One of these is *RealFlow 3*, a complete standalone fluid-simulation application that integrates with all of the major 3D packages. Although not based on real-world units, *RealFlow 3* simulates visually realistic fluid – a more scientifically accurate version is planned for the future.

So why use *RealFlow* rather than one of the fluid-simulation systems built into the major 3D packages – Maya Fluids, for example? One reason is cost. Fluids doesn't come built into *Maya Complete*, and *RealFlow 3* is a fraction of the price of *Maya Unlimited*. Secondly, it generates great inter-particle reactions, creating effects that would be hard to achieve in *Maya* itself. And finally, it's very easy to use.

FLOW MOTION

In this tutorial, you'll be using the software to create an animation of liquid flowing into a mould to create the aquatic character shown on the right. You'll learn how to quickly set up a scene, how to set up several of *RealFlow's* daemons (forces) and also find some tips on how to use more complex models and higher-resolution fluids for a more realistic simulation.

I used *Maya* to render out the finished simulation, but any *RealFlow*-compatible host application would do the same job. The evaluation version of *RealFlow 3* is included on this issue's CD (see page 114) and is virtually a full version of the software – so even if you aren't already a *RealFlow* user, you can still follow along.

Darren D'Agostino is a professional designer based in New York, with skills in print, web, video and 3D. He's currently developing www.liquidmasters.com, an online community for fluid simulation
[w] www.offtherackpro.com

FACTFILE

FOR
RealFlow 3

DIFFICULTY
Intermediate

TIME TAKEN
5 hours

ON THE CD
- Readme file (with vital *RealFlow* tips)
- Full-size screenshots
- Base model (OBJ format)
- *RealFlow 3* and *Maya 6* scene files
- Test animations
- Final animation

ALSO REQUIRED
Maya, or *RealFlow*-compatible host app

Custom MEL scripting and final rendering of animation frames by Scott Willman

ON THE CD

Non-time-limited evaluation version of *RealFlow 3*

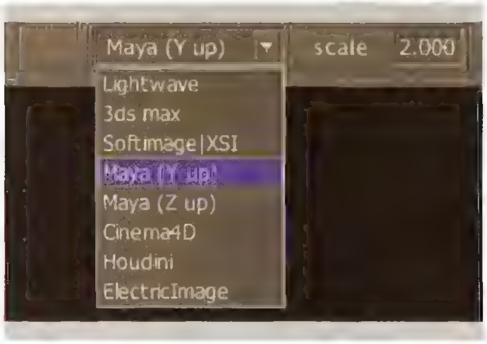
SEE PAGE 114

STAGE ONE | Setting up your RealFlow scene

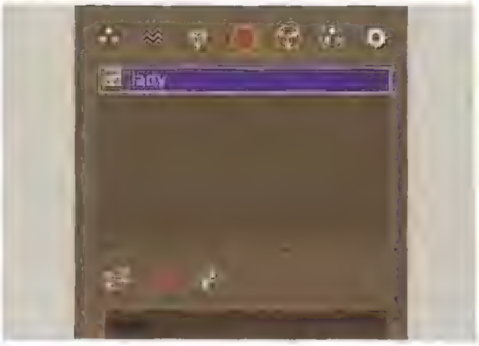
EXPERT TIP

Learn the Ropes

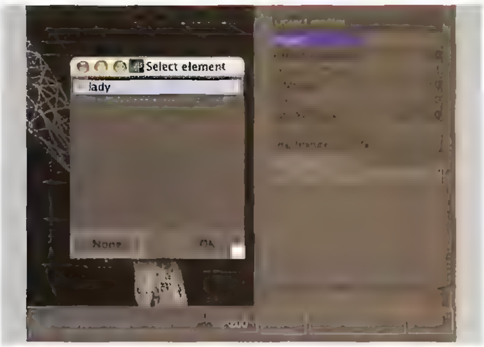
As usual with new software packages, it's a good idea to familiarise yourself with the *RealFlow 3* interface, manipulation tools and keyboard shortcuts before you start your project – especially the [Q], [W], [E], [R], [1], [2], [3] and [4] shortcuts (or hotkeys). When creating your watery character, these will help you work much faster, just as they do in your 3D host app. Go to Help > Contents and check the Getting Started section and *RealFlow 3* Layout.



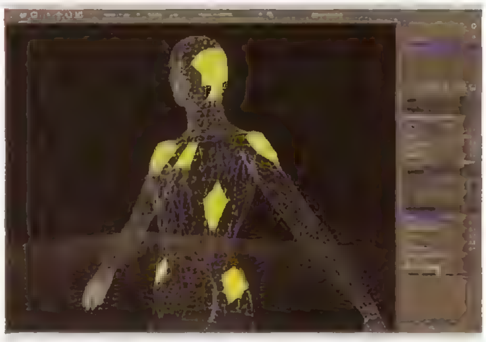
01 When you start a new scene in *RealFlow 3* you must set up your environment based on the 3D host app you use in the Environment selection. This will affect the axis and placement of things globally. Set the Scale to 2. Scale lets you resize all imported objects without having to re-export them, and your objects, particles, and meshes will line up when you import them into the host app.



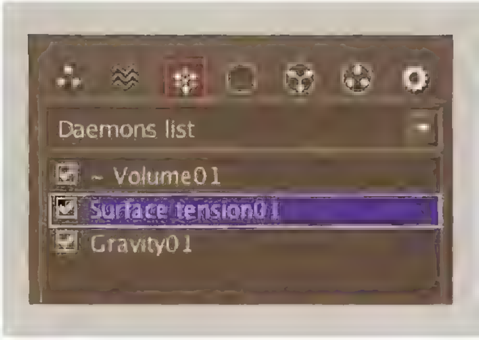
02 Import the female model into your scene from the Objects panel. It will appear in the scene in the same position and scale it as it was in the host app. For the purpose of this tutorial, this model is scaled down and has low detail to save on sim time but, when using emitters, it's best to create a life-sized version of your object before importing it. Avoid using objects that fill up the world space.



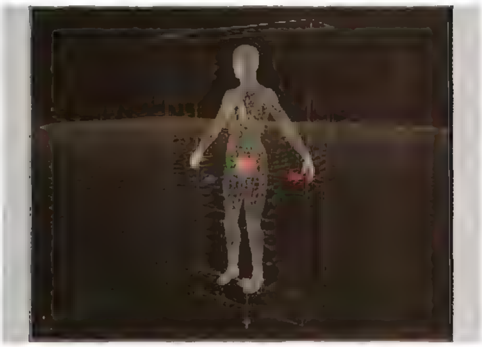
03 For this tutorial, you're going to make fluid particles emit from polygonal faces of the model instead of shooting particles into the model. First, open the Emitter panel and select Object emitter from the Emitters list. Under the Object emitter attributes, click on the "-" next to the Object box, and select Lady from the Select Element pop-up window.



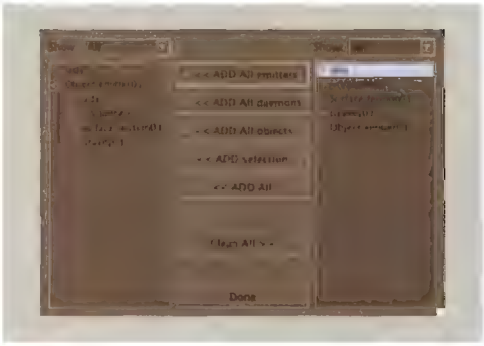
04 Click Select Faces and select the faces of the model that'll emit particles – on the top-back of the head, shoulders, chest, back, hips and knees. Spreading out faces will make it more interesting. Select the model, open the Display tab, click Show Normals and set Normal type to Face. If normals are pointing away from the model, hit Reverse Normals or your particles will emit outwards.



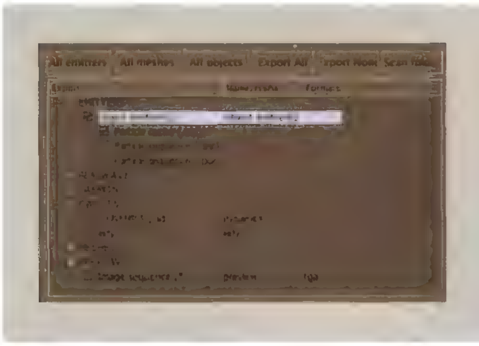
05 Now you add three forces to the scene. Go to the Daemons panel and create Gravity, Surface tension, and ~Volume. Set the surface tension strength to 500 and set Balanced to Yes. This will help hold the particles together. Very high tensions settings should only be used when doing small-scale sims, and you can raise the tension into the millions if you choose to.



06 Open the ~Volume daemon settings. Click Fit To Object, and the Volume box will auto scale slightly larger than your model. Pressures will build up as the model fills, and some particles may break through. Once they pass out of the Volume box they'll die. Without this, your sim time can start going up, as these stray particles will keep moving and will need to be calculated.

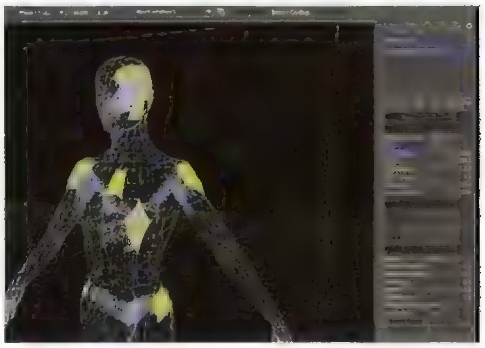


07 Open the Scene Tree. This is where you control how objects, daemons and emitters are linked. You should see the three daemons underneath the Object emitter. Daemons are added automatically to an emitter if there's only one in the scene. Drag the Lady object from the right side to the Object emitter on the left to add it. Now the particles emitted will collide with the model.

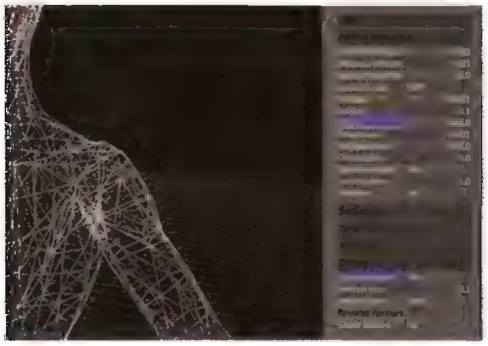


08 Open Export Central. Here, you tell *RealFlow 3* what to export when you sim. Click the empty box next to Object emitter so it'll export a sequence of .bin files. *RealFlow 3* saves one .bin file of particles for every frame of animation so you can import the sequence into your 3D package, play it back in *RealFlow* or generate a mesh sequence. Don't forget to do this.

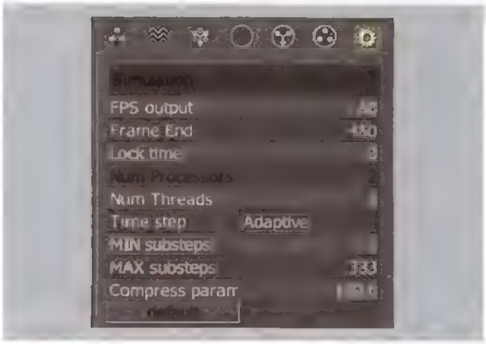
STAGE TWO | Simulating particles



09 Hit the Action button to start the simulation. Notice that you won't see any particles. Generally, emitter resolution needs to be higher than 1 when using Object emitters. I've chosen a resolution of 10. While you change this, you *should* also make changes to the other Fluid Attributes. Hit Action to begin simulating particles (see the screenshot above for the Attribute settings).



10 Hit Action to stop the sim. Rewind, and play the sequence back. Notice that the particles move slowly, and bounce off the model. Default collision settings may cause your particle system to explode or act oddly, so open the model's Particle Interaction tab to make changes. The Sticky setting (see Tip) will make particles cling to the model, so you can see the form as the sim progresses. Again, see the screeshot above for the settings.



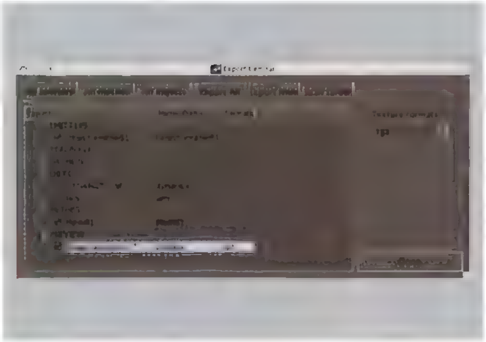
Simulation
FPS output 60
Frame End 450
Lock time 0
Num Processors 2
Num Threads
Time step Adaptive
MIN substeps
MAX substeps 333
Compress param

11 The result looks nice, but it's moving too fast. Rather than adjust the emitter, I'm going to adjust the scene options. Use 60fps and set Frame End to 450 to slow the sim, and stretch the timeline. This will double the frames and usually should be done for a slow motion effect at 120fps or higher. Lowering Max substeps and Compression parameter speeds up the sim but makes it less accurate.

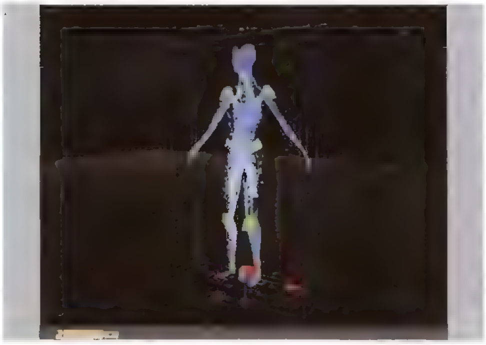
EXPERT TIP

Sticky Situation

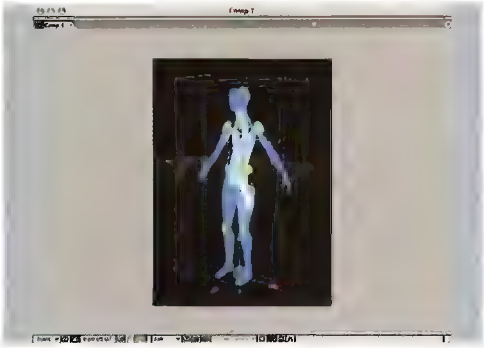
The Sticky setting can generate unpredictable results. The thing to remember is that it's directly related to gravity and emitter types. Object attributes such as Roughness, Friction, and Bounce will make the fluid react differently as well and it'll vary from scene to scene and object to object. When trying to create a specific fluid for a specific scene, tons of testing and tweaking will be needed, so don't feel too frustrated if it doesn't look great the first time you try. Experimentation is key.



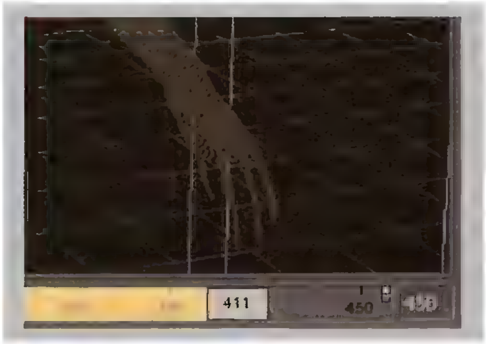
12 If you have dual processors, you can cut sim time drastically by setting Num Threads to 4 in Options. Open Export Central and check off the Image sequence so a TGA image preview sequence of your particle sequence will be saved along with the .bin files. Also, to the left of the Action button is a box that specifies the sim Stop frame. Change 200 to 411 so the sim stops later.



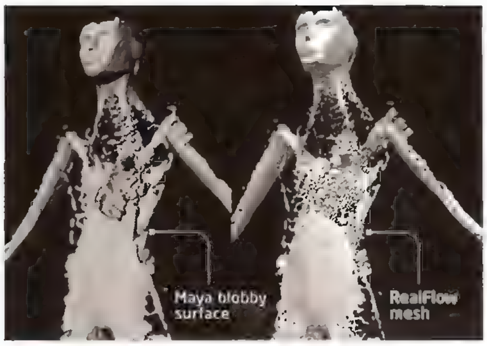
13 Fit the character in Perspective view, and view it as Bounding Box to hide the wires, so you can see how the particles animate. Don't move the camera when saving an image preview, or it'll be distracting. Select the emitter, hit Reset, then hit Action, and find something else to do for a while: the sim will take about ten and a half hours (depending on your system) and roughly 4.5GB HD space.



14 Back up your project folder. Open your video editing app and import the TGA sequence from the Preview folder. Size down and crop the stage to fit. Export a 30fps movie and you'll see how your particles move. Now play back the sim in *RealFlow*. Notice it doesn't play real-time because of the large files, even when increasing the cache in options. That's why you save image previews.

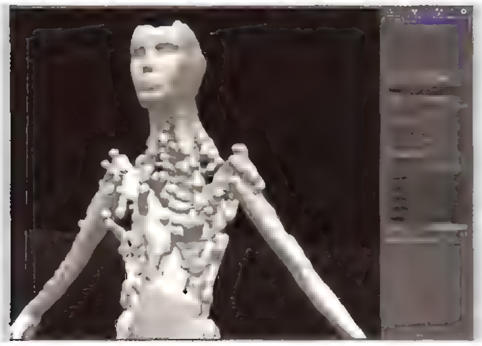


15 This model fills in 411 frames, but always sim a sequence until you know how many frames are needed. Sim the first few seconds to get the desired motion and collisions before doing the whole thing: if you are not completely happy with your particles, make changes and re-sim. If *RealFlow* crashes, scan folders in Export Central to load the simulated particles before continuing.

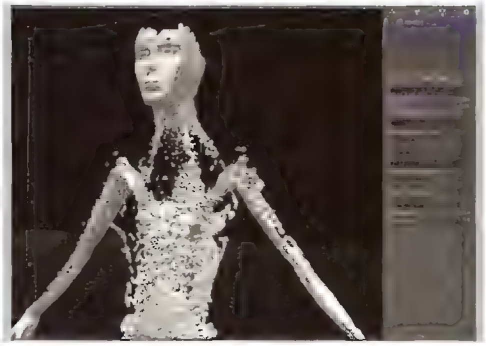


16 At this point, you could import your particle sequence into your 3D app, manipulate the particles further and render them. I've had OK results using blobby surfaces in *Maya* but not great results. For more control, detail and a more realistic-looking fluid, you'll create a polygon mesh in *RealFlow 3* and then import the finished mesh sequence into your 3D host app.

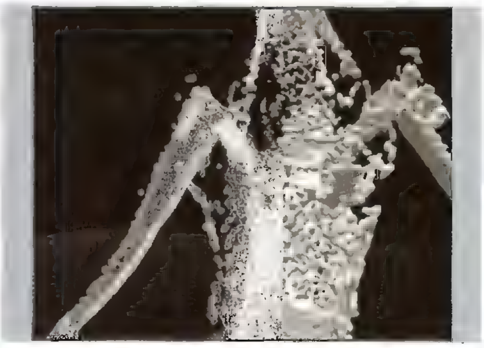
STAGE THREE Building a mesh



17 Create a new mesh from the Mesh panel and the emitter will automatically be added to the mesh. Multiple emitters can be added to the same mesh (but not automatically), so you're left with one mesh. Open Export Central and check off the mesh so it'll be saved. Go to frame 75 and click the Build Mesh button. Read the help files to learn about advanced mesh capabilities.

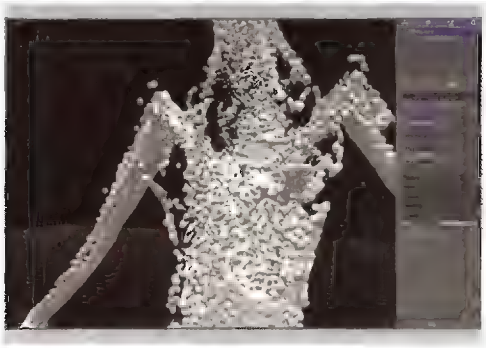


18 View the mesh as Flat shaded or Smooth shaded or you won't see it. View the model as Bounding Box to see the mesh clearly. The mesh's polygon size should default to 0.03 (in this scene) and will look very blobby, so you'll need to make some adjustments. Click the Object emitter under the mesh, change the blend to 100 and the Metaball radius to 0.01, and click Build Mesh.

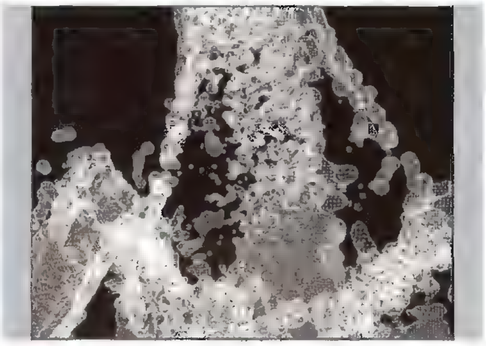


19 The smaller radius gives us a finer shape, and the blend makes the Metaballs blend together more, but now the polygons are too large and make the mesh look very angular. Change the polygon size to 0.02 and build the mesh again. View your mesh as Smooth shaded and then as a wireframe to see how the polys are laid out.

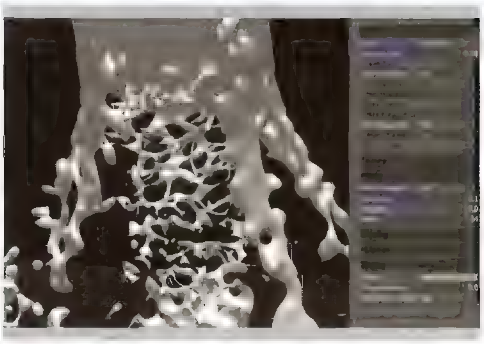
STAGE FOUR Refining the details of the mesh



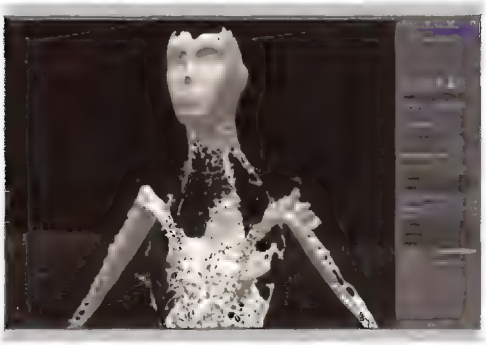
20 There are still some angular parts on the mesh, so zoom into it for a closer look. For specific projects you'll know the camera moves, so you can adjust your mesh based on that. A distant shot will need less detail than a close-up one. For this tutorial we're going to make the mesh a bit finer. Change the polygon size to 0.01 and build the mesh again.



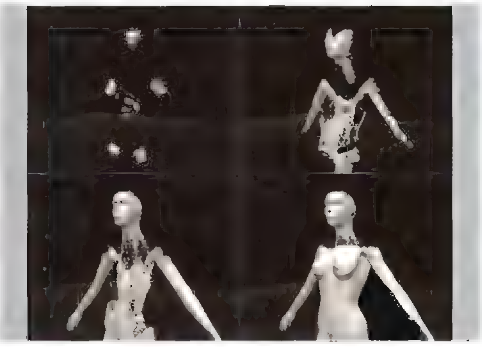
21 Now our mesh is nice and smooth, but there are some minuscule droplets and the mesh still looks too bumpy. To fix this, use a Mesh filter to relax the fluid. Personal preference and the overall look you're aiming for will determine these settings. Since we have no specific fluid we're shooting for, I'm going to relax the mesh slightly so it has a watery/glycerin look.



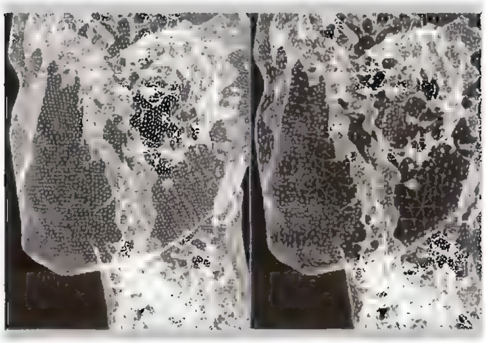
22 Open the Mesh Filters tab and set the Filter method to Yes to enable it. The default Relaxation should be 0.1 with 0 Tension and 64 steps. Notice that, when you build the mesh this time, it takes longer to process as *RealFlow* needs to apply the filter as well. While this has helped thin and smooth the mesh, some parts are too pointy.



23 Relaxing over 0.3 or 0.4 causes some or all of the mesh to disappear, destroys detail, and may cause a crash. Increasing the steps helps sometimes. For more detail, use a higher-res model and a high emitter resolution (20-100) using a low collision distance and distance tolerance. This can take many days to sim, and is not necessary for this tutorial. Set Relaxation to 0.08 and build.

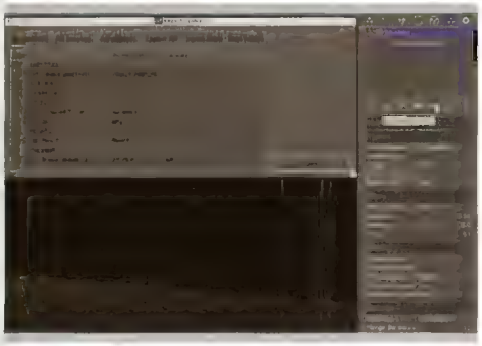


24 Build the mesh on a few different frames just to see how the settings translate. I like to choose three or four frames from the beginning, middle and end of the sequence and a few frames that are adjacent. You may want to turn on preview or save screenshots so you can open the frames in *Photoshop* and compare them before meshing the entire thing.

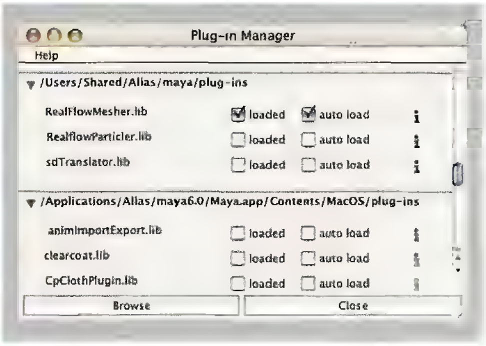


25 Now you're going to optimise the mesh, based on curvature to lower the poly count. Open the Optimize tab and set Optimize to Curvature. The default settings will be fine for your needs. Optimising will increase the processing time but will also lower file size and help speed up rendering. Not optimising a complex mesh can cause your 3D host app to crash or drag excessively.

STAGE FIVE | Generating the mesh sequence



26 Make sure the mesh is checked off in Export Central and uncheck Preview. Rewind to the beginning of the sequence and click the Build Mesh on Play button in the Mesh panel. When you hit Play, *RealFlow 3* will generate a mesh and save a .bin file in the Mesh folder for each frame. It may take more than 24 hours to build the sequence and approximately 8.5GB of drive space.



Plug-in Manager

Help

▼ /Users/Shared/Alias/maya/plug-ins

RealFlowMesher.lib ☑ loaded ☑ auto load

RealflowParticler.lib ☐ loaded ☐ auto load

sdTranslator.lib ☐ loaded ☐ auto load

▼ /Applications/Alias/maya6.0/Maya.app/Contents/MacOS/plug-ins

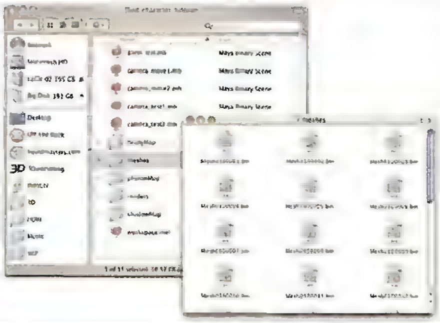
animImportExport.lib ☐ loaded ☐ auto load

clearcoat.lib ☐ loaded ☐ auto load

CpClothPlugin.lib ☐ loaded ☐ auto load

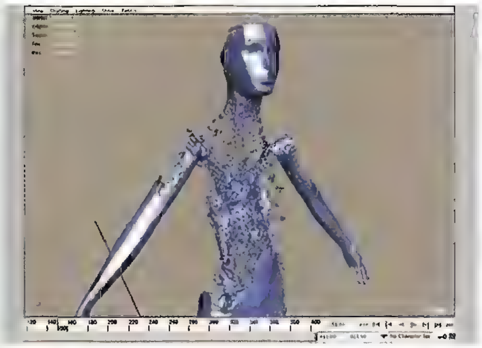
Browse | Close

27 Now you have a completed mesh to import into your 3D package. I used *Maya 6.0.1 Complete* but you can use any application compatible with *RealFlow 3*. First install the plug-ins from the CD and (in *Maya*) open the Plug-in Manager. Enable at least the RealFlowMesher.lib, as you're not importing SD files or particles. A new menu item called Next Limit will appear in the menu bar.

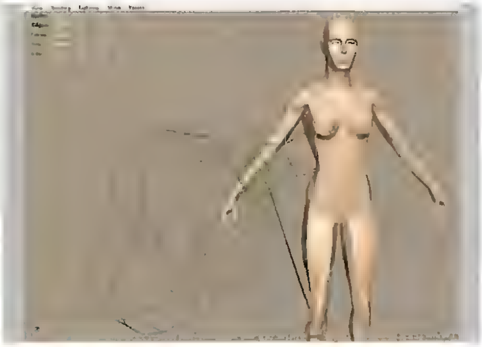


28 I like to move my mesh files into my project folder to ensure they can't get overwritten if I go back into *RealFlow 3* for some reason. When I create my *Maya* project, I create a folder called Meshes and move all my .bin files there to keep things organised. If you have drive space, backing up these .bin files would be wise.

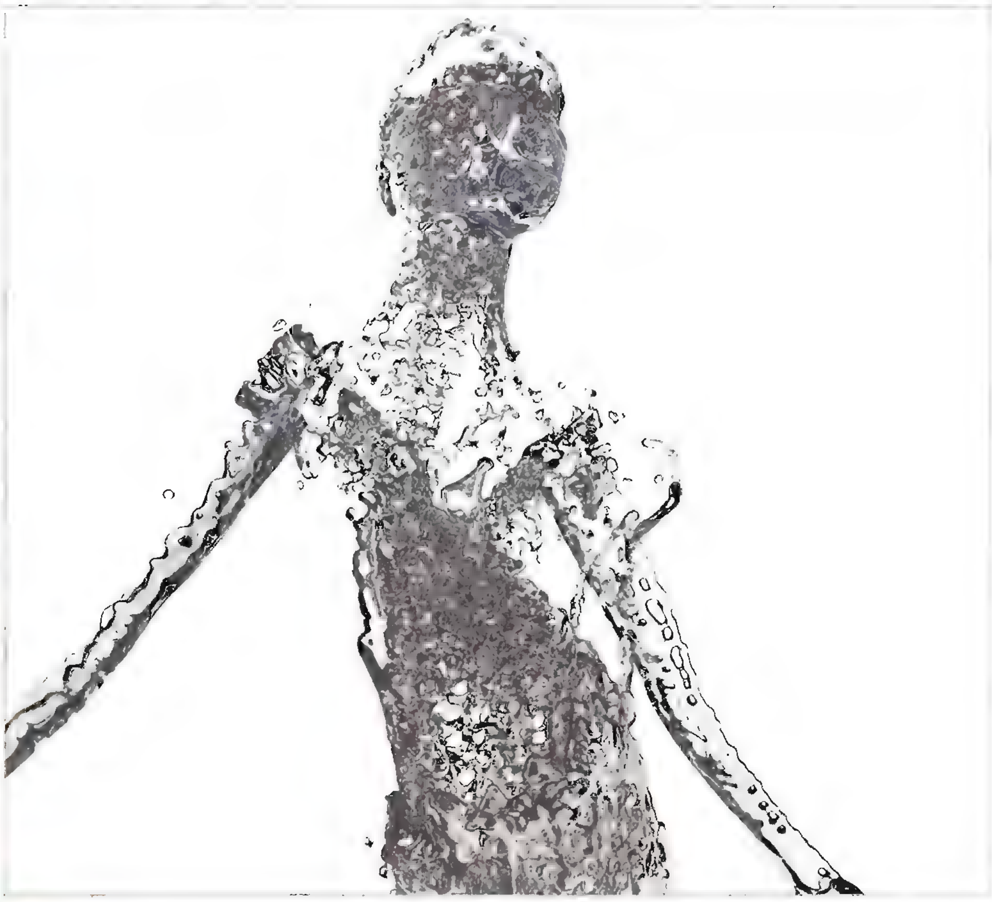
STAGE SIX | Spit and polish



29 Set your scene to centimeters, 30fps and 411 frames. In the menu, choose Next Limit > RealFlow > Mesh Loader to open the pop-up. Click the Browse button and locate your mesh folder. Select one file and click Open, then hit OK to close the pop-up. This loads the sequence in *Maya*. Jump to any frame, create a simple blue Lambert or Blinn shader and drag it to the mesh.



30 Render out a draft animation using the Maya Software renderer to see your fluid in action. Once that's done, you can play with camera moves and shaders. I suggest importing the original model for this, and make Playblasts to check the camera. The complex mesh will make *Maya* drag so you can either remove the mesh or hide it. You can view the completed test animations on the CD.



31 The final animation uses *mental ray* renderer with HDRI lighting. it also uses 2000 Final Gather rays with *mental ray* Dielectric material applied to the mesh for realistic reflections and refractions. There are DOSCH HDRI files supplied on the CD to load into the IBL node in *mental ray* Globals. I loaded the rendered IFF sequence in *After Effects*, tweaked the light curves, and rendered 640x640 to switch things up for a change. You can learn more about HDRI, IBL and *mental ray* shaders in *Maya*'s help files and on the web. Both add realism to renders with minimal effort in ways that are pretty difficult to achieve with basic shaders and lights. As always with this kind of tutorial, the exact details depend on the specific project you're doing and also on your personal tastes as an artist.

TRADE SECRETS

Normal mapping

Say goodbye to dull surfaces with our high-speed tour of the games industry's hottest new technique **BY JOLYON WEBB**

If you aim to work in games, it's worth playing around with normal mapping. Now one of the industry's hottest topics, normal maps make the surface of a game model look much more detailed and impressive. This detail is displayed in real time: the images in the article are screengrabs, not renders.

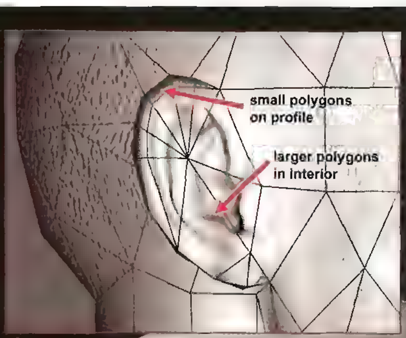
To create a normal map, a 3D software package samples the directions in which the surfaces of a detailed model (a higher-resolution version of the in-game object) face, storing the information as coloured pixels. The map is then applied to the lower-resolution object, passing information about the hi-res model to the lighting calculations.

In this article, we'll be providing a brief overview of the issues that normal mapping throws up. At present, a common approach is to build the hi-res source model immediately, but I feel it can be more effective to start with the lo-res final model. Firstly, starting low makes it easier to revise proportions, and allows for vital early rigging and animation tests. Secondly, once the lo-res is finished, it is a simple job to add polish. With subjects like the pirate on the right, I recommend exporting the mesh to *ZBrush 2*: a great tool for sculpting in organic detail.

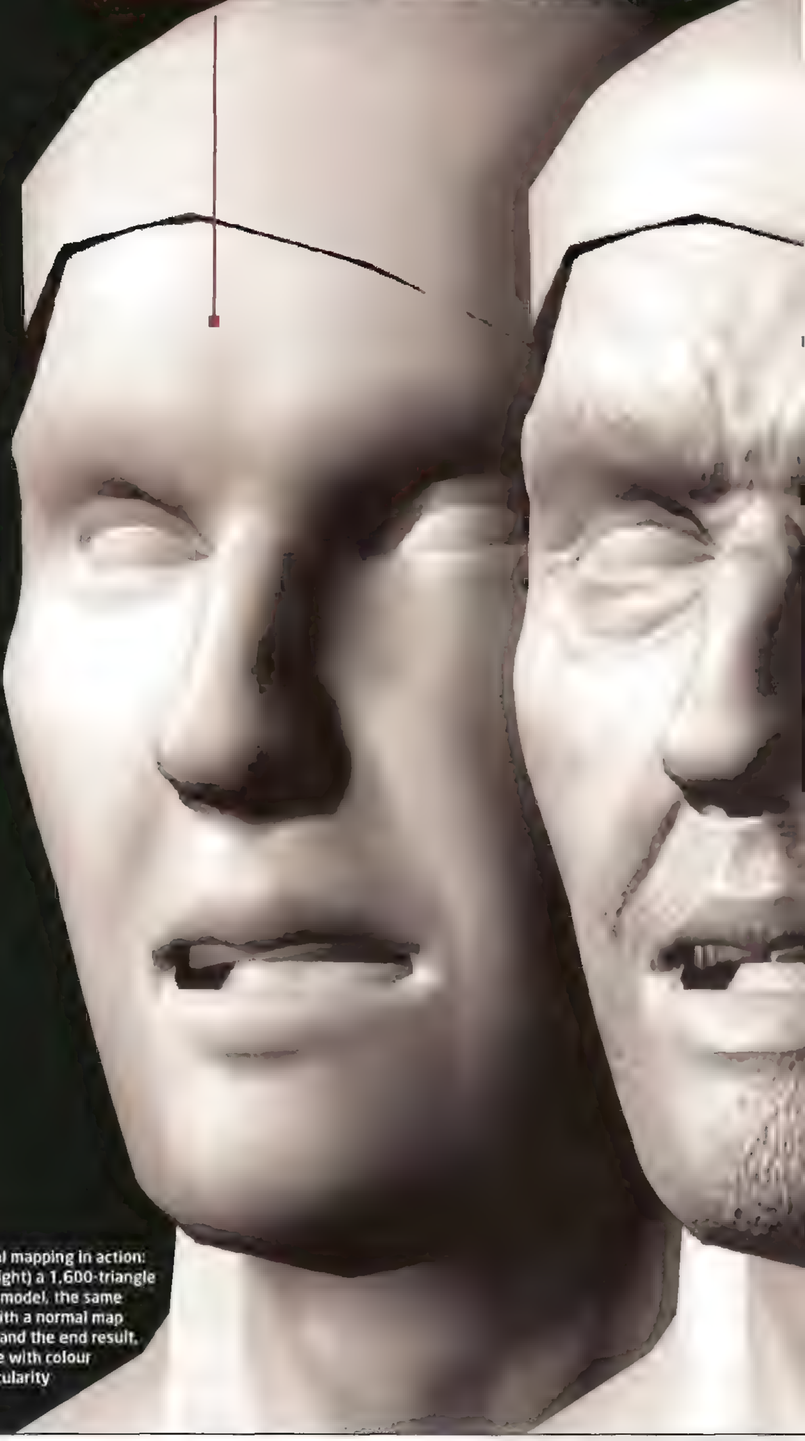
With both models finished, you can capture the map. The pirate uses *3ds max 7*'s Render to Texture tools, but an alternative would be ATI's free *NormalMapper* plug-in for *Maya* and earlier versions of *max* (**www.ati.com/developer/tools.html**). In each case, a good result depends on a close fit between the volumes of the two models.

The final step is to check the map in your 3D package, using a suitable hardware shader. It will probably need editing in some areas, but you should immediately see a big increase in how detailed the in-game model looks.

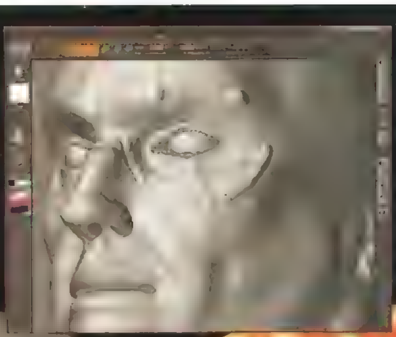
Jolyon Webb has worked for Codemasters for seven years, and is relishing the advent of next-generation consoles **[w] www.codemasters.com**



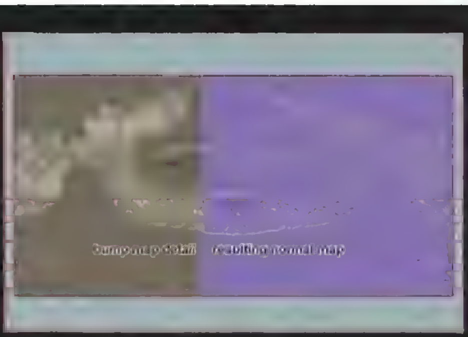
01 Normal maps are great for adding surface complexity to a lower-res model, but they can't add detail to a model's silhouette. Bear this in mind when you model, and add enough geometry to 'round out' parts you can see in silhouette. Looking at our ear, you can see that geometry is spent on the profile, but saved on the interior.



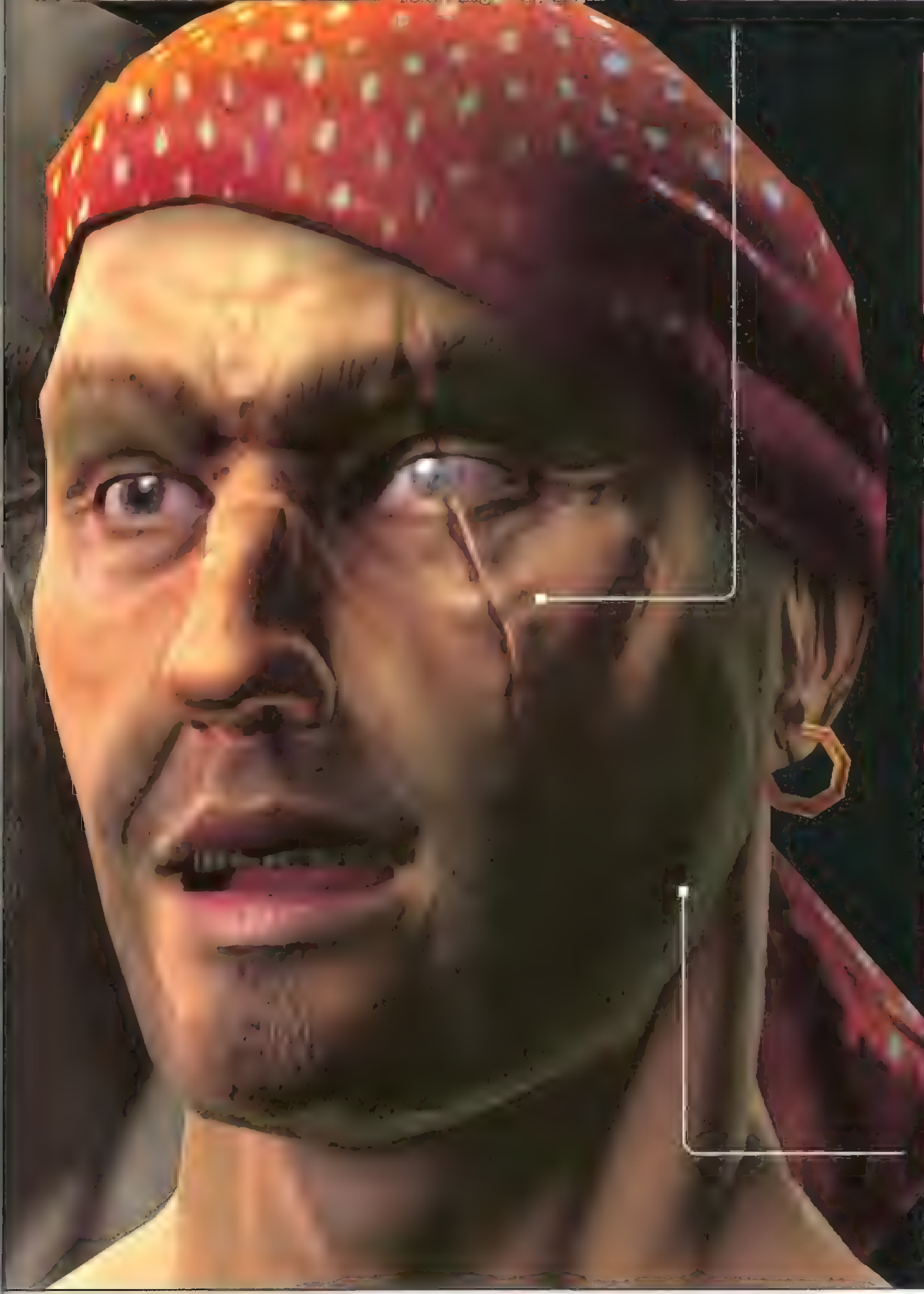
Normal mapping in action: (left to right) a 1,600-triangle in-game model, the same model with a normal map applied, and the end result, complete with colour and specularity

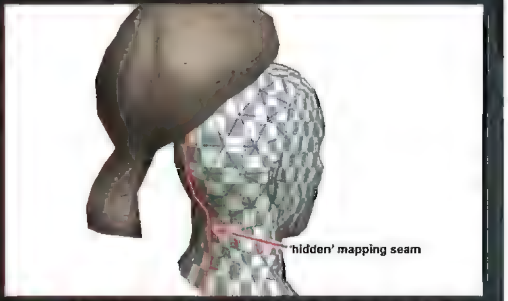


02 *ZBrush 2*'s interface is unlike most 3D apps; it can feel strange at first, but works well once you're familiar with it. This is a fantastic package, highly optimised for working on dense meshes. Our final pirate mesh is resed-up from 1,600 triangles to half a million triangles. *ZBrush 2* handles OBJ and DXF mesh formats, which allows the import and export of models using [illegible] 3D packages.

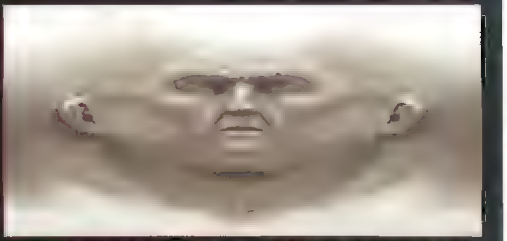


03 Hi-res geometry produces great normal maps, but meshes can become unworkably dense if really fine details are added. Painting bump maps for stubble and spots is more efficient. The greyscale map is converted to a normal map using Nvidia's brilliant free *Photoshop* filter (visit http://developer.nvidia.com/object/nv_texture_tools.html), then overlaid onto areas of the original normal map.





04 Map seams can cause lighting artefacts when you're using normal maps. To avoid this, plan to map your model with as few seams as possible, or try to hide the seams away. For example, if we lift our pirate's headscarf we can see that the scarf on top of the head and hanging down his neck does a good job of hiding the major mapping seams on the head.



05 Game lighting works much better when normal maps are used. This means that our model's colour maps can now use much less painted shadow and highlight than has been traditional for game textures. However, it's worth baking out shadow detail from your hi-res source mesh. Use this shadow detail to add subtle shading to the colour map, and also to act as a painting guide.

06 Shaders can use more than just normal maps to affect lighting; it's also a good idea to use maps to control specularity. *Half-Life 2* and *Doom 3* are current games worth studying to see how much the specular mapping component contributes to visual quality. Our pirate has a noisy specular map to help break up highlights in a more skin-like way.

ON THE CD
All the software and files needed for this tutorial
PAGE 114

FUTURE ISSUES

Issue 65
Using timing and deformations to inject personality into the hopper's movement
Issue 66
Building a simple control rig for the hopper for more precise control of the animation
Issue 67
Making use of the control rig from issue 66 to change the personality of the character

SOFTIMAGE|XSI

Get started in animation

Part 1

3D animation may seem a daunting prospect for a newcomer. But follow our new series of beginners' tutorials, and you'll soon have the little character shown above up and hopping

BY OLA MADSEN

FACTFILE

FOR
Softimage|XSI, XSI 4.2 Mod Tool (on CD)

DIFFICULTY
Elementary

TIME TAKEN
1-2 hours

ON THE CD
- *Softimage|XSI 4.2 Mod Tool*
- Start and finish *XSI* scene files, 3D model
- Full-size screengrabs
- Final animation

ALSO REQUIRED
N/A

While having the largest box of crayons in class may have been thrilling when you were a kid, it had little or nothing to do with the quality of the images you drew. Although we doubt that anyone would seriously argue with this, it's something people often forget when it comes to 3D. With the manuals of modern 3D applications weighing more than the contents of a school satchel, it's as easy to be dazzled by the number of features available as it was by the number of crayons. But the basics of 3D are exactly that - basic enough for anyone to follow.

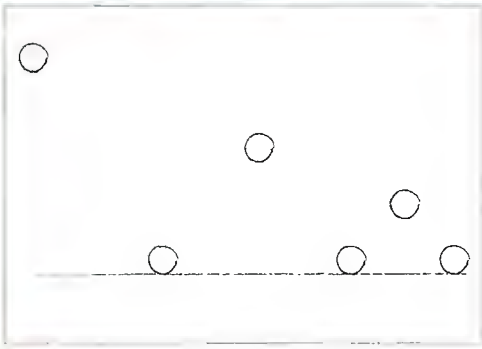
During this four-part tutorial series, we'll introduce you to the fundamental concepts of 3D animation. While primarily aimed at newcomers, we also encourage more experienced users to drop by our 3D kindergarten, no matter how well you know your software, there's no substitute to an understanding of the principles of weight and timing. At the end of the day, animation is all about bringing things to life, not marvelling at the tools employed to do so.

There are few exercises that can be used to explain the basic principles of animation as efficiently as recreating the motion of a bouncing ball. The staple of many college courses, this simple looking task actually involves all the elements that will make or break a much more complex animation. To add a new twist to the proceedings, we've replaced the ball with the '70s-style toy above. In the first of these tutorials, we'll simply concentrate on making it bounce in a realistic manner. In future issues, we'll tackle the slightly more complex challenge of injecting emotion into its movements.

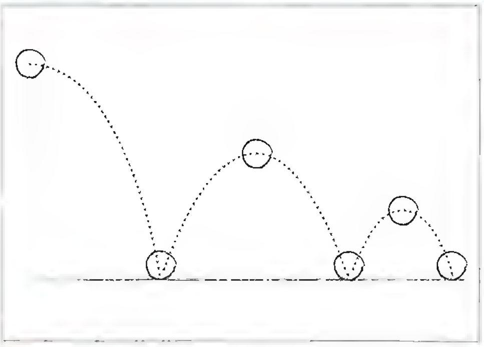
For this tutorial, we'll be using *Softimage|XSI* – we've included a copy of the educational version (the *Softimage|XSI Mod Tool*) on the CD. Although it has certain limitations, it will be more than adequate for the purpose. We've also provided a model of the toy itself on the disc, pre-built and ready to animate. Just load it in, and follow the walkthrough to the right. If you get stuck with any of the technical terms, you can download a glossary from **www.3dworldmag.com**

When not bouncing around his Swedish studio on his hopper, Ola animates everything from medical treatments to cute furry teddy bears. He also had the largest box of crayons in class
[w] www.digitalcontext.se

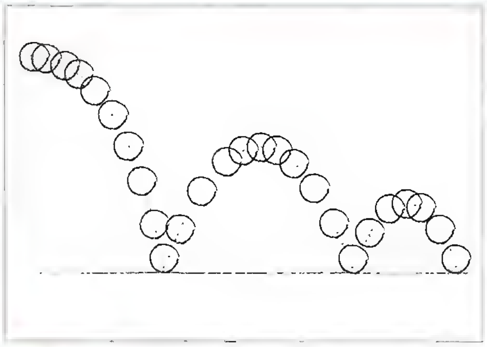
STAGE ONE | The basics of bounce



01 Let's start off by having a closer look at what's happening to the hopper in reality, and what we're expecting to recreate in our animation. The image above shows the three extreme positions of a ball going down and back up. While this theoretically would be enough information to produce an animation, it doesn't tell us anything about what's happening between those positions.

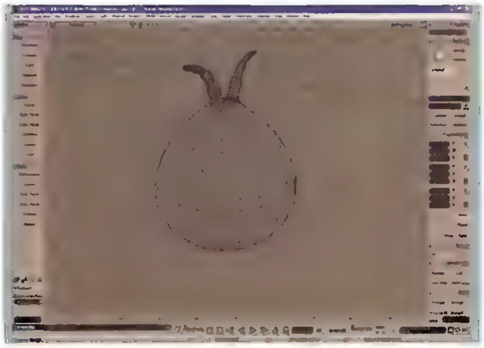


02 On this image, we've added the path along which the ball is going to travel. Almost every real-life movement, if traced in this way between point 'a' and point 'b', would describe an arc-like path rather than a straight line. This is important to remember: animating motions, rotations, and so on in straight lines will result in jerky-looking, unnatural animation. Now, let's add the timing.

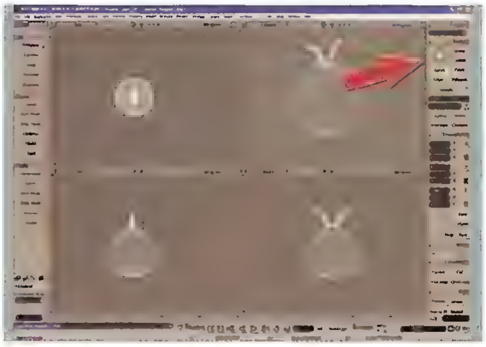


03 As the ball falls towards the ground, it accelerates due to the force of gravity. Since the ball is travelling faster at each frame, it'll obviously travel a greater distance, creating larger spacing between each keyframe until it makes contact with the ground. Directly after contact, we get the opposite action. The ball's momentum pushes it off the ground rapidly, but slows down as gravity catches on.

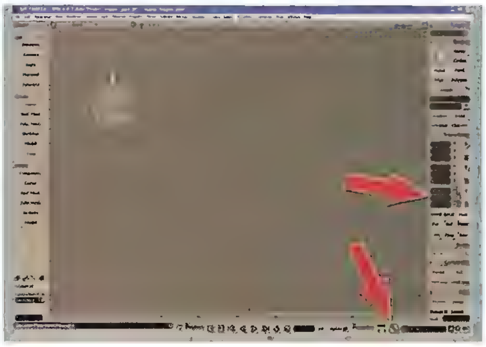
STAGE TWO | Setting keyframes



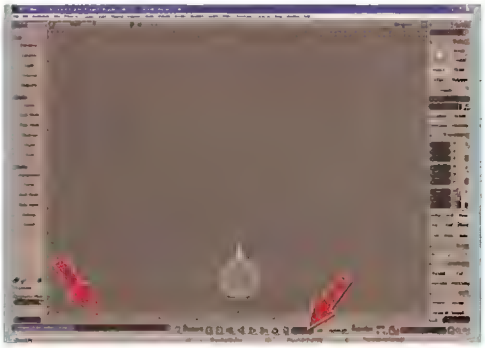
04 With the basic concept clear, we should be able to put this into practice. Locate the file named hopper.scn on this issue's CD, and open it. The scene is pretty much a 3D representation of the image from the previous step, and it contains two objects: the hopper toy, which is our stand-in for the traditional ball, and a grid, which will act as the ground.



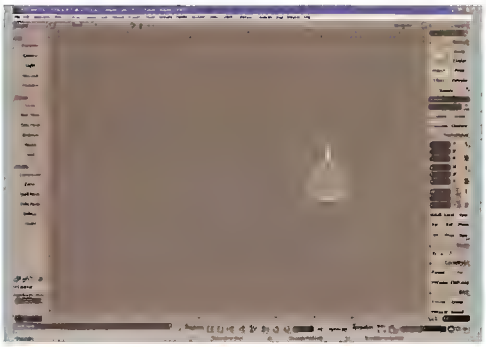
05 The first thing we'll do is create a rough breakdown of the animation – just establish the key positions (or extremes) and build on these. While you usually work on several parameters simultaneously, for clarity we'll focus on one at a time. Click on the large arrow in the top right corner (or hotkey [Spacebar]) to ensure you have the selection tool enabled, and select the hopper object.



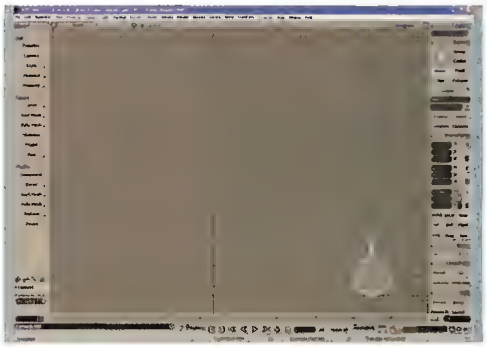
06 Maximise the front viewport (position your mouse within its boundary and press [F12]). Activate the Translate tool (hotkey [V]) and move the hopper about 35 units upwards and 30 units to the left. This will be the starting position for the bounce. Click the Key button in the lower right corner of the interface (or hotkey [K]) to set a keyframe for the object's position. Refer to step 3 as a guide.



07 The next position to set is where the hopper meets the ground for the first bounce. Go to frame 15 by scrubbing the timeline or by entering it directly in the time box, move the hopper back to its original position, and set a new keyframe. Note that the Key button will set a keyframe only for the currently selected parameter; have the right tool activated and ensure you're at the correct frame.

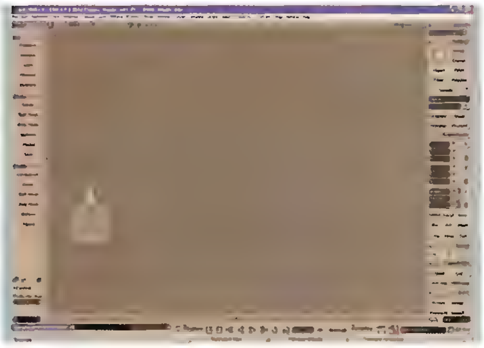


08 The momentum of the hopper will make it bounce to the right but not as high as its first position, since it has lost some of its energy. Go to frame 26 and move the hopper 15 units to the right (on the X-axis) and 20 units upwards (on the Y-axis) before setting another keyframe. Note that the X and Y values aren't that precise, so use them more as a guide than a prescription.

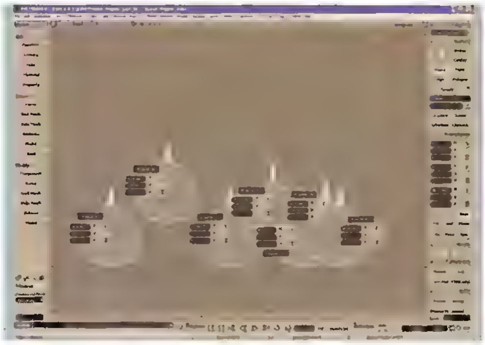


09 The hopper should touch the ground for the second time at frame 37; it should have travelled another 12 units to the right from the last position and naturally be positioned on the ground plane again. We still need about four bounces before it has lost all of its energy and comes to rest on the ground for good, so let's get to it.

STAGE TWO [Continued] | Setting keyframes



10 At frame 45, position the hopper at the absolute position of X=45 and Y=14, and set a keyframe. The next contact position occurs at frame 54, with the X roughly at 55 and the Y back at 3 again. To keep up the pace, we'll just quickly list the remaining frames, for which you'll need to set another keyframe, and the corresponding values.



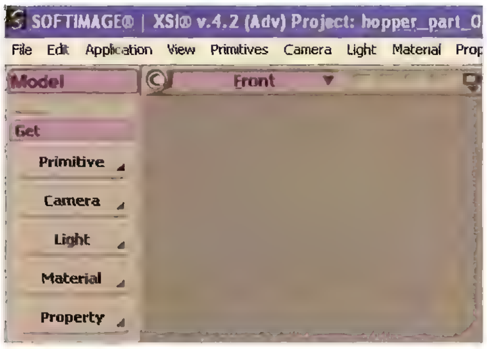
11 If you get lost along the way, please refer to the high-resolution version of the screenshot above on the CD. At frame 60, X=63 and Y=9, at frame 67, X=70 and Y=3, at frame 72, X=75 and Y=6, at frame 76, X=80 and Y=3, at frame 79, X=85 and Y=4 and at frame 82, where the hopper comes to rest, you should have the values X=86 and Y=3.

EXPERT TIP

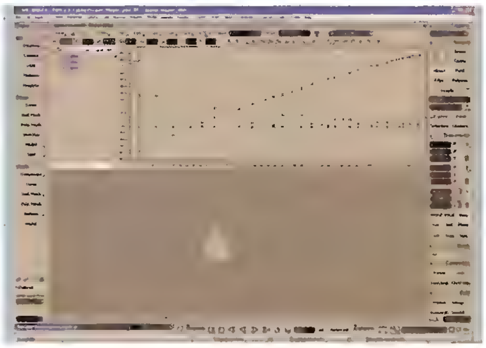
Defining keyframes

A keyframe can be described as a placeholder, enabling you to store any type of information for an object/parameter at a given time. Whenever you have two keyframes with the same type of info but with different values (e.g. the hopper's position), *XSI* will automatically calculate the new values between them. The more keyframes you add to your animation, the harder it can be to control and maintain a smooth fluid motion. As a general rule, you should always strive to build your animations using as few keyframes as possible.

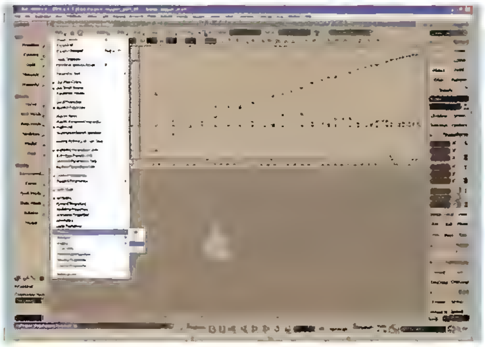
STAGE THREE | Adjusting the function curves



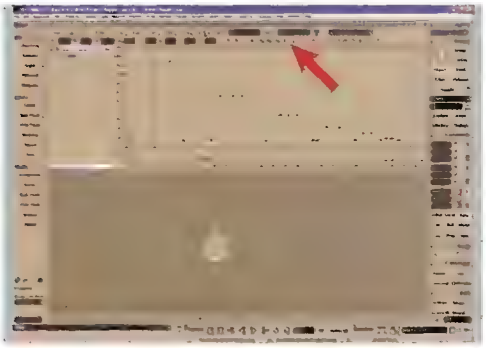
12 To get a sense of what we've created so far, click the Play button in the Playback panel at the bottom of the screen (or hotkey [Up arrow]). While we undoubtedly now have an animation where the hopper passes each of the keyframes we've just created, it's still far away from giving the appearance of a ball bouncing along the ground. Don't worry though; we'll fix it in the next few steps.



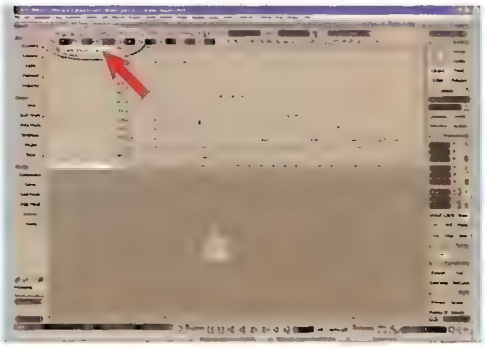
13 Press the [0] (zero) key on you keyboard to open the Animation editor. Navigate your viewport so the Animation editor, as well as the entire animation, is visible. Press the [S] key to activate the Multi-purpose navigation tool, and use the left and middle mouse buttons to Track and Zoom (when in a perspective view, use the right button to orbit).



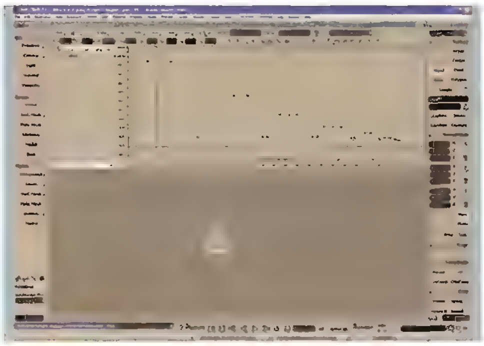
14 A Function curve is a graphical representation of a parameter's change of value over time. As the curve changes direction, or eases in or out, so will the animation corresponding to it. On more complex animations, the Animation editor can swiftly become over-cluttered. To stay in control, use one of the filtering options offered. From the Animation editor menu, click View > Position > Y.



15 With the F-curve for the Y-axis isolated, press [A] on your keyboard to frame the entire curve. We'll start by fixing the problems with the contact positions. Select the second keyframe on the left (representing the first contact position) and make sure Unified Slope Orientation (see screenshot on CD) is turned off, letting us modify the slope handles on each side of the keyframe independently.

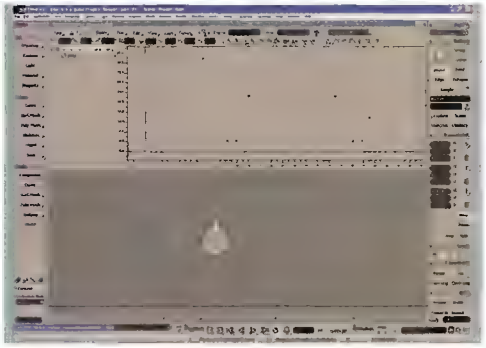


16 To modify the slope on the curve, and therefore the hopper's speed and motion, we can either move the handles directly or enter a value in the Slope Control fields. Moving the handles to point straight upwards (left and right angle value set to -90 and 90) would give us the desired acceleration as the hopper falls towards the ground, but the contact would be a bit too 'snappy'.

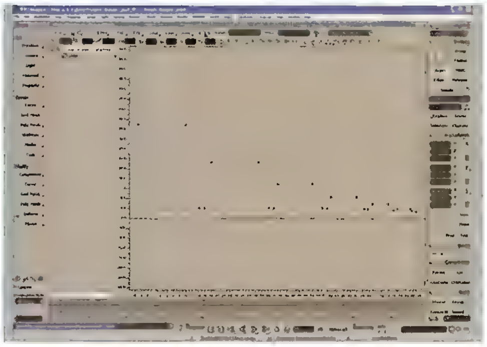


17 By using lower values, say -60 and 60, we'll still only have contact with the ground for a single frame, but the motion will appear slightly smoother. If the handles are to have the right influence on the curve, we also need to change their length. Set length for both of them to just about one. Repeat step 16 and 17 for the other five keyframes marking the hopper's contacts with the ground.

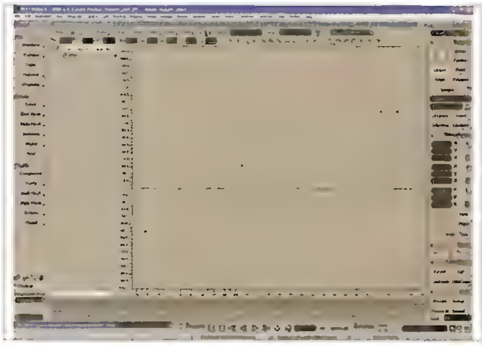
STAGE THREE (Continued) | Adjusting the function curves



18 Moving on to the high points, we want to create the impression of the hopper almost hanging in the air. In fact, for a short period of time, the hopper is weightless, at the point when its momentum is exactly balanced by gravity. Giving the high-point keyframes a flat slope, with a relatively substantial ease in and out, will form just these conditions.

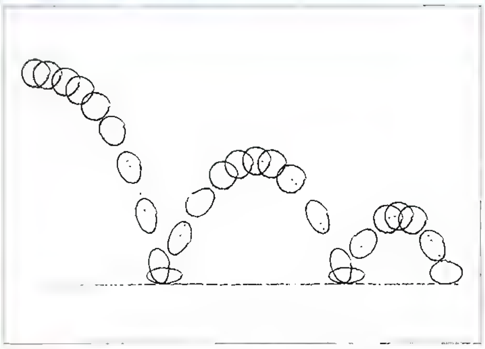


19 Select the first keyframe on the left, and set the left and right handles' slope angle to 0. Set the length of the slope handle to about 10. Repeat for the other five high-point keyframes, but gradually decrease the handles' lengths for each successive keyframe. The F-curve for the Y position is coming along rather nicely, but we still have a bit of a jerky motion going on that we need to eradicate.



20 From the Animation Editor menu, click View > Position > X. Looking at the X-axis' F-curve, we can see that it isn't as smooth as it should be. While we could alter each keyframe to get the result we're after, it's easier to delete all the keyframes except the first and last. Move their respective slope handles to create a subtle upward arc. Play the animation to see the changes.

STAGE FOUR | Adding squash and stretch

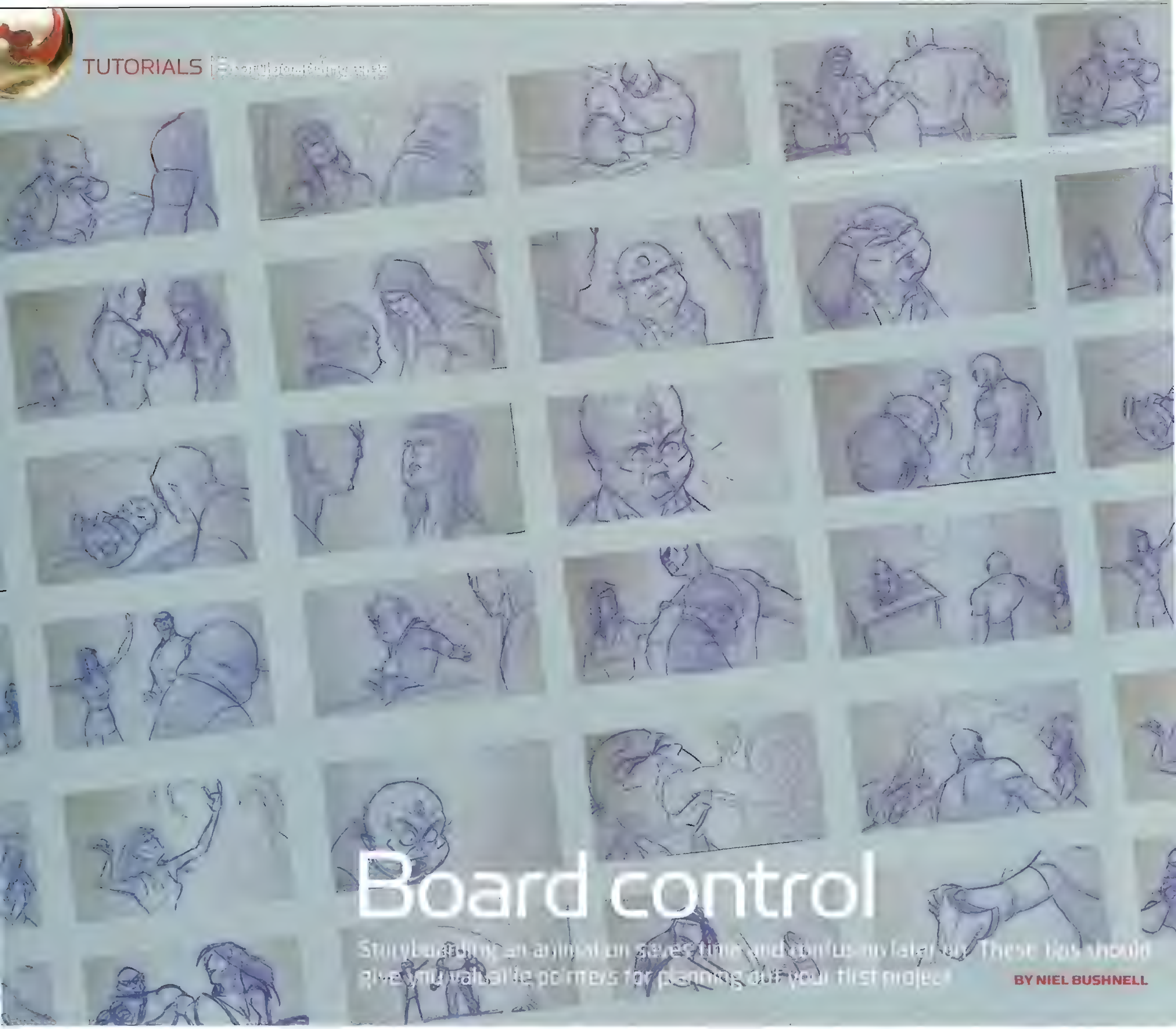


21 Developed by the masters at Walt Disney in the '30s, the discovery of this technique is one of the most significant in the history of animation. Most organic objects found in nature have some sort of flexibility; the amount of squash and stretch is defined by the substance. Everything shapeshifts when exposed to force, even though this effect is often too subtle to detect on more rigid objects.

squash
stretch

22 Since the hopper is made of flexible rubber, it will stretch as it accelerates downwards, then squash upon contact with the ground. As it moves upwards, it will stretch once again, before regaining its original shape at the highest point of the arc. It's vital to note that even if there's a change within its shape, the hopper's actual volume always remains unchanged.

23 Press [X] to activate the Scale tool. In the Transform panel, click on the Vol button to maintain the hopper's volume by compensating in the other axes as you scale the object. Go to each frame with a high-point keyframe (1, 26, 45, 60, 72, and 79) and set a keyframe with the scaling set to 1 on all three axes. Go to frame 14, volume scale the hopper along the Y-axis (to about 1.1) and set a keyframe. At frame 15, scale it down along the Y-axis (to about 0.85) and set another keyframe. Reposition it to make contact with the ground and set a keyframe for the position as well. At frame 16, scale up to about 1.1 again and set a new keyframe. Repeat the procedure for all contact positions. Play back the animation, and you should see the hopper squash and stretch as it bounces. See you next issue... ●



Board control

Storyboarding an animation saves time and confusion later on. These tips should give you valuable pointers for planning out your first project

BY NIEL BUSHNELL

A storyboard is a visual script that helps everyone involved in a production to understand exactly what's required for each shot. While the basic concept may be universal, the exact function of a storyboard will vary according to the type of project for which it was created. For example, traditional 2D animated series use storyboards as templates for the animators to follow. As 2D animation is typically produced in a different country to the boards themselves, it's vital that they include as much information as possible. Typically, this will include every key pose of the animation, where the camera should be positioned, and how each shot should be composed.

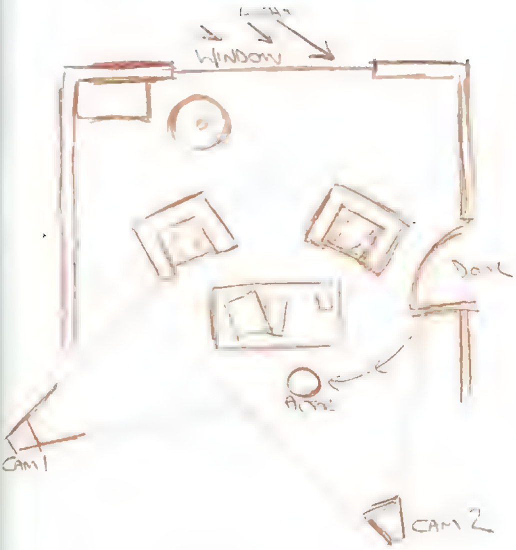
By comparison, the storyboards for a 3D or live-action film will usually be far less polished, and will be stuck to less rigidly. Live-action filmmakers typically use storyboards only for complex scenes, or those including visual effects work that needs to be planned out in advance of the shoot; while some directors prefer to board out an entire film, this is rare. By contrast, TV commercials tend to be boarded out as part of the pitch process. Sometimes the boards can be used as one of the marketing tools to help green-light a project, especially if the investors are having trouble envisaging how a complex script might be translated onto the screen.

These days many productions also use storyboards to create an animated storyboard, or 'animatic' – a version of the finished film made from the storyboard images, which is used to test edits and scene timings. The animatic is a draft version of the final film; as shots are completed, they're dropped into the animatic, replacing the storyboard image. Without this simple tool to save time, money and confusion, most modern feature films could never be made.

While most storyboard artists still use basic tools such as pencil, paper and marker pens, you don't necessarily need to be a great artist. Some people use toys or action figures to create their storyboards; others simply pose actors or friends, then video or photograph the results. Whatever your medium of choice, the five tips on the right should contain much of the information you need to get started.

Our expert this issue...

Niel Bushnell is the founder of Qurios Entertainment, a UK-based studio specialising in storyboarding, illustration, concept design and animation. He has worked on numerous commercials, feature films, television series and computer games. His most recent storyboarding work was for a series of pop videos and Qurios' second short film, *All Colours Grey*.
[w] www.qurios.com



ABOVE Making a plan of your scene can help you to position your cameras and create a good board sequence. Think of how to cover the action – what are the best places to view it from?

DON'T CROSS THE LINE!

When storyboarding, it's important to know something about staging for film and television. One classic rule is known as 'crossing the line'. This is important in a 'two-shot', where two actors are filmed from either side by two cameras. To help the viewer understand the geography of the scene, the two cameras should not cross an imaginary centre line. In other words, Actor 1 should always be on the left-hand side of the screen when viewed from either camera. If you cross over this imaginary line, the viewer will have difficulty following the action. See the boxout below for an example of how to storyboard a two-shot.

CREATE A PLAN VIEW

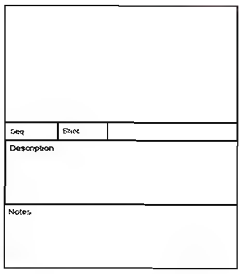
Take the time to sketch out your scene as a plan view (looking down on it from above), and think about where you'll need to place your cameras. It's a good idea to treat the animation as a live-action shot, and think about where the best positions for a camera would be. Also envisage how the action moves around the set. You'll soon realise that particular scenes look best from certain angles, so exploit these positions. Much like live-action, some 3D projects only use partial sets, so you may be limited in the directions from which you can shoot, but a good boarder can make the best of a small or partial set.

RATIO, LENSES AND TECHNOBABBLE

Know what aspect ratio (the ratio of the width of the screen to its height) you're working in before you start drawing. If the shape of the storyboard panels don't match that of the animation, you'll be severely limiting the usefulness of the board. Standard formats include 4:3 or 16:9 for TV, and 2.35:1 for cinema, although there are many others. It's also helpful (although not, in my experience, vital) to know a little about camera lenses and their effects. Finally, familiarise yourself with camera-speak! Words like pan, dolly, locked-off, flip and flop should become second nature to you. And don't forget to compensate for TV cut-off. All film and video loses a portion of its outer edge due to cut-off during the transfer from drawing to screen.

GET ORGANISED

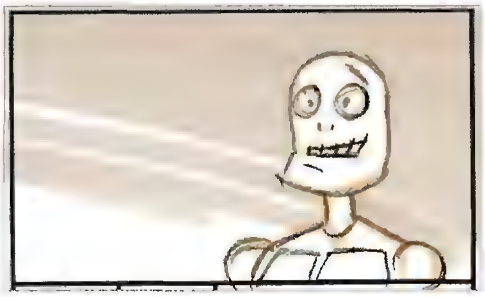
It sounds obvious, but you can quickly become swamped in drawings for a project. A complex sequence might require dozens, or even hundreds of images. Establish a numbering sequence early on and stick to it. It's worth creating a template for your boards, too (see image, right). This should have space for your drawing, the scene or sequence number, and notes, dialogue or scene descriptions. I prefer not to work too large, the bigger the picture, the longer it will take you to draw! Try putting two to four of your templates on an A4 sheet and see which size you're most comfortable with. Once you've got a template you like, print out lots of copies.



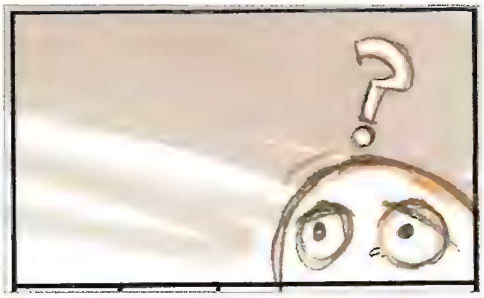
ABOVE One possible layout for a storyboard. Experiment with your own – don't work too large, and keep the images numbered

OBEY THE RULES OF COMPOSITION

The best films follow the same basic rules of composition as classical painting and architecture. Make sure that your shot makes maximum use of the frame; allow the image to breathe, don't overcrowd it. Dead space or bad composition can make a scene distracting, and cause the viewer to lose track of what's going on. If you don't know much about composition, take a trip around your local art gallery, drawing inspiration from sources outside of film and TV will also help to keep your work fresh, and may just give you the jump on the next guy. ●

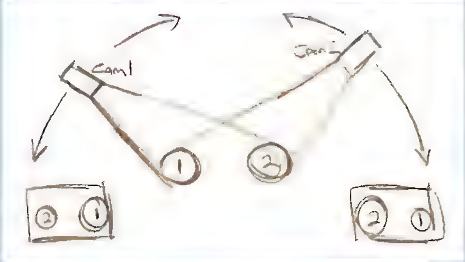


ABOVE Good composition. There are mathematical reasons why some compositions look better than others, but most artists are able to judge this instinctively

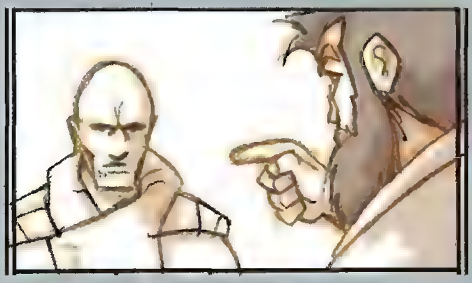


ABOVE Not so good composition! This is an exaggerated example, but it's a common mistake to put a person's head in the bottom half of the frame, with lots of dead space above

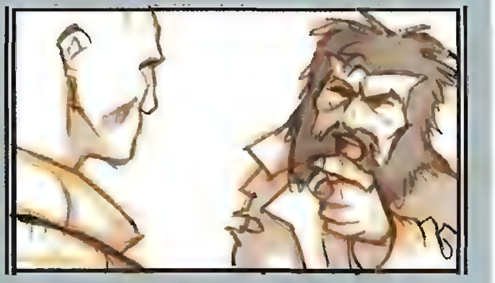
INSIDE TRACK | Storyboarding a two-shot



01 **A typical two-shot**
Here's a simple scene featuring two actors and filmed by two cameras. All the action will be captured from one side of an imaginary line, and the cameras won't cross this line



02 **The camera one view**
Note that the bald actor appears on the left of the screen in this shot. This establishes one side of the line of action, and also establishes the geography of the scene from the viewer's perspective.



03 **The camera two view**
Despite the change of angle, the bald actor still appears on the left of the screen, so the relative positions of the characters are maintained throughout the scene, enabling the viewer to follow the action

Using *Cloth*, you can create an entire wardrobe for your 3D characters – the only problem you'll have is deciding what they're going to wear

3DS MAX

Prêt-à-porter

This tutorial gives you one of the first opportunities to try out 3ds max's new cloth-creation tools – they're free to registered users

BY CHRIS OLLIS

FACTFILE

FOR
3ds max and *Cloth/clothFX*

DIFFICULTY
Intermediate

TIME TAKEN
One hour

ON THE CD
- Start and Finish MAX files
- Full-size screenshots
- Final animations

Discreet recently gave away *clothFX*, which was previously a third-party plug-in, as part of its subscription service to registered *3ds max* users. Under the slightly revamped title of *Cloth* it adds a simple-to-use and more adaptable clothing solution to *max's* arsenal than the existing Cloth dynamic, which is available through Reactor.

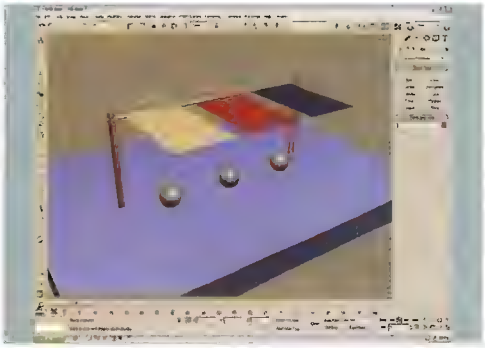
As well as offering a very robust physics simulation with a wide variety of preset variables, *Cloth* also provides a means of to constructing articles of clothing from scratch using traditional tailoring techniques. This approach opens up whole new levels of possible detail and realism in terms of what your characters wear, with complex, multi-textured fabrics and constructive forces such as Seam Strength and Crease Angles affecting the way in which material moves.

This tutorial will introduce you to the three main aspects of *Cloth*, starting with a look at how different Cloth settings provide subtle and impressive variation between geometry when a dynamic simulation is applied. We'll then cover the use of existing modelled geometry as a piece of clothing is applied to an animated biped. Finally, we'll start tinkering with *Cloth's* Garment Maker tools to get a glimpse at what can be achieved when you take the tailor-made approach to 3D character dress making.

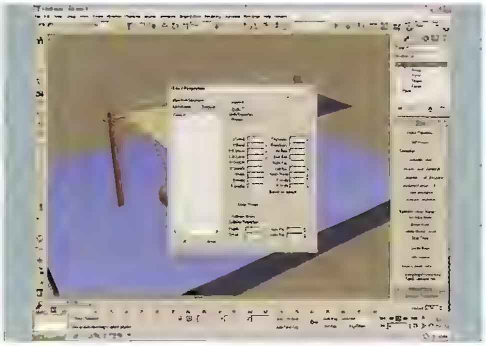
Once you've got the hang of it, *Cloth* is a very useful bit of kit. Its subtle and realistic movements can really bring animations to life and, when it's used for complex layered cloth, the results can almost steal the scene. So have a play, get hooked and start making your very own fashion statements – don't just hold *Cloth* in reserve for whenever you need a flag blowing in the wind! And if you're not a *3ds max* subscriber, don't throw this tutorial away – in the past new features made available to subscribers have been incorporated into future releases of the software. This issue's CD contains full-size screenshots, Start and Finish max files for each section of this tutorial and rendered animations of the final effects.

Chris Ollis works as an animator at Codemasters. His winter collection went down a storm at Paris Fashion week…
[w] www.InterTwined.co.uk

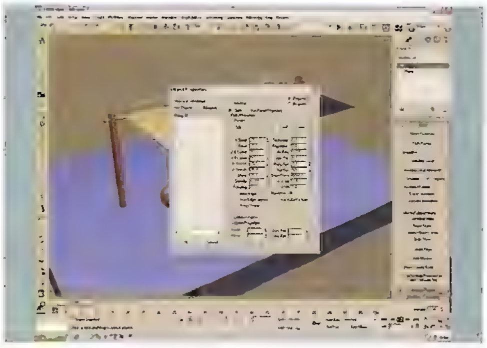
STAGE ONE | Understanding the differences in cloth types



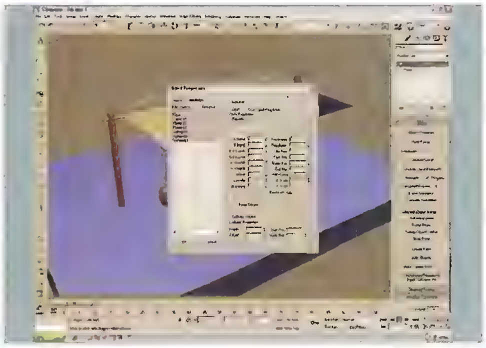
01 The first thing we'll do is look at the Cloth modifier itself. We'll apply it in its most basic form to some simple geometry, and observe the results. While this doesn't sound very exciting, it actually provides some instantly entertaining results, and demonstrates the variation between cloth types. Load up the file Cloth_pt1_start.max from this issue's CD and we'll begin.



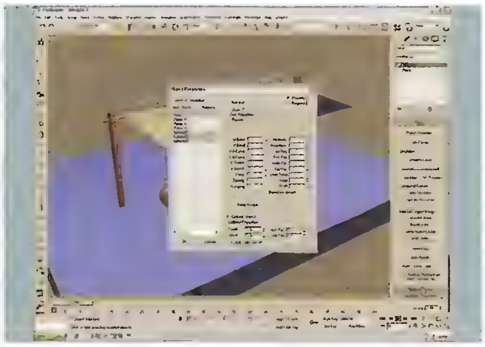
02 The scene contains three plane objects, a bar and a selection of collision objects. Select the first plane (Plane 01) and, from the Modifier List, select the new Cloth modifier. From the top of the panel, select Object Properties to bring up a new window; this window will be used to display all the cloth objects and associated geometry in the scene.



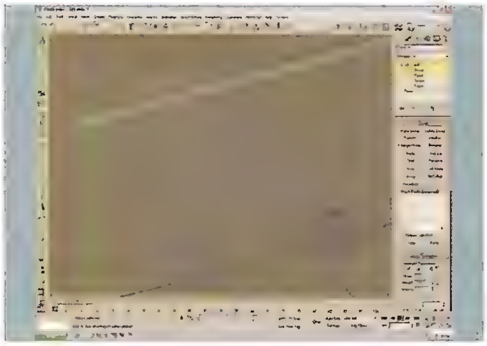
03 In this new window select Plane 01, and click the radio button next to the word Cloth. The various cloth parameters will become active; from this list you can adjust the properties of your object to simulate the multitude of cloth densities, flexibilities and weights. But we'll keep things simple for now; click on the Presets drop-down menu and select 'Silk'.



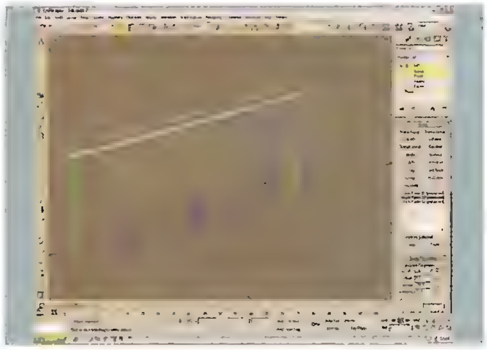
04 You could apply a separate Cloth modifier to every cloth object in the scene but, to keep things simple and accessible, we'll work from within this first window. Click on the Add Objects button in the top-left corner and select 'Plane 02', 'Plane 03', 'Floor' and the spheres from the list. Now select 'Plane 02', click the Cloth radio button and pick 'Rubber' from the Preset list.



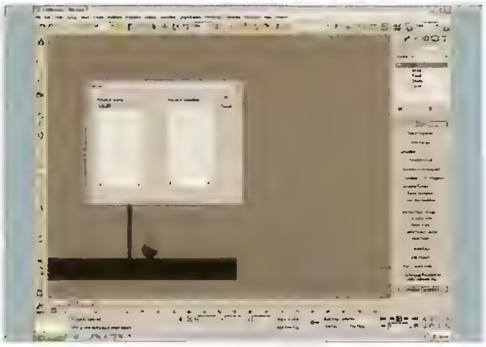
05 Do the same for Plane 03 and select 'Heavy Leather' from the presets. Finally, select 'Floor' and the sphere objects but, this time, we'll make them collision objects by selecting the radio button at the bottom of the window. Again, new options are available, but we'll leave them for now. Hit OK to close the window.



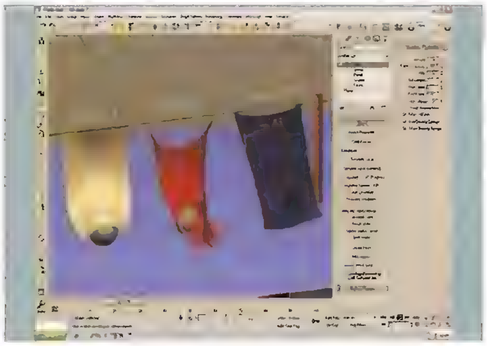
06 Before we see how the cloth behaves, we'll attach it to the bar. Select each plane in turn and, under the sub-objects of the Cloth modifier, select 'Group'. The plane's vertices become available; select the two corner vertices nearest the bar then press the Make Group button. Call the group Stuck Points. Click OK and then press the Preserve button.



07 This basically tells the Cloth modifier to ignore the selected group of vertices, leaving them to do whatever it was they were doing before it got involved - in this case, nothing. Repeat this process to attach Panel 2 and 3 to the bar by their corner vertices. Once the panels are attached you can drop out of Sub-object mode and return to the main options.

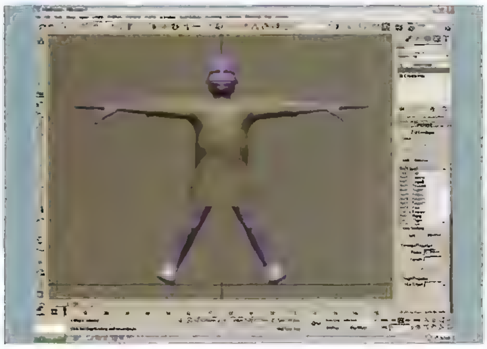


08 The last thing we'll do is add an external force. Select the Cloth Forces button from the Modifier panel and add Wind01 from the list. That's it: we're now ready to go. Hit the Simulate button, and sit back while max calculates the way the three samples of cloth behave. If you have a slow machine this could take a minute.

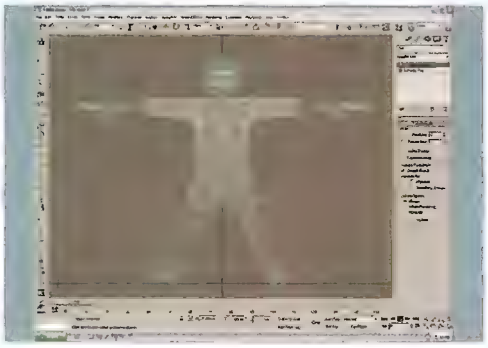


09 Chances are the cloth will pass through the spheres slightly. Don't panic; this is easily remedied by increasing the number of collision calculations performed per frame. Raise the Subsample value to 2 or 3 and hit Simulate again. To see how it should turn out, load up the file Cloth_pt1_finish.max.

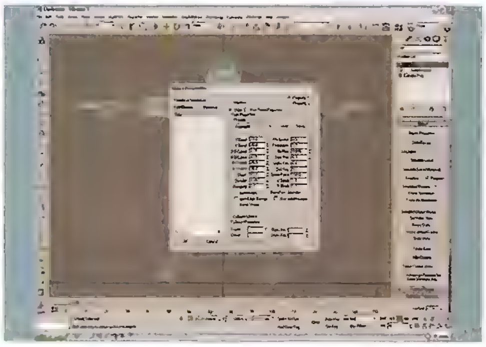
STAGE TWO | Dressing a character with standard geometry



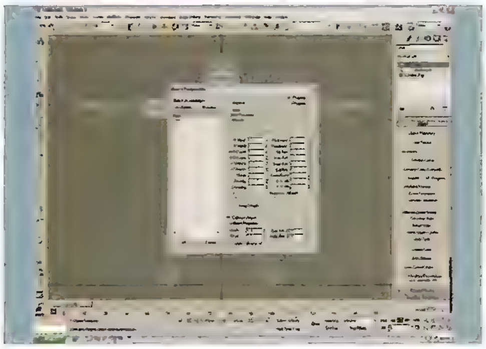
10 Load up the file Cloth_pt2_Start.max from this issue's CD. The file contains a simple model of an alien, which has been rigged with a *character studio* Biped and then quickly animated. The animation should be sufficient to demonstrate the natural motion of the new Cloth modifier; scrub through the frames to see what he does.



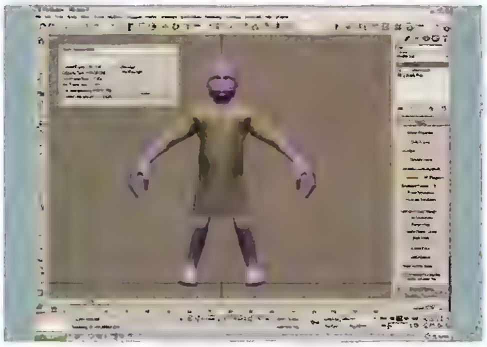
11 The Shirt object was quickly created by duplicating the alien's skin, and then adding a Push modifier to expand it slightly. A TurboSmooth modifier has been added as well to provide some extra geometry. Don't worry about your mesh being too complex when working with *Cloth*; while your computer may slow down and not like it, the modifier itself prefers the added detail.



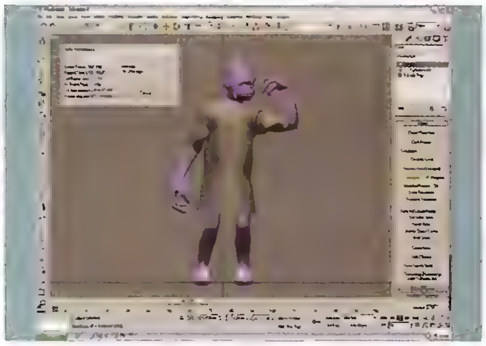
12 Select the Shirt object and apply a Cloth modifier. As before, select 'Object Properties' from the top of the Modifier panel. In the new window select the Shirt object and click on the Cloth Radio button then, from the Preset list, select 'Spandex' to provide the shirt with a slightly stretchy quality.



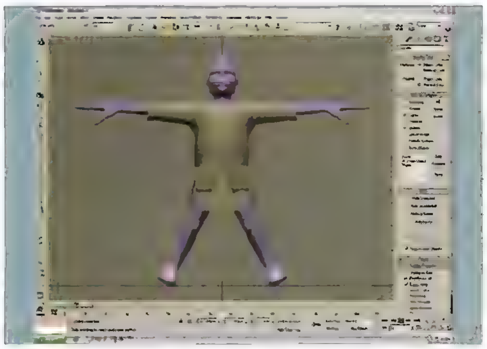
13 Next, click the Add Objects button and add the Alien model itself. This will be our collision object. Drop the Offset value under Collision Properties down to 0.3, so the cloth sits closer to the skin. Close that window, and click the Simulate Local button. This will perform the dynamic simulation on the current static scene, and will help to start the cloth in a natural position.



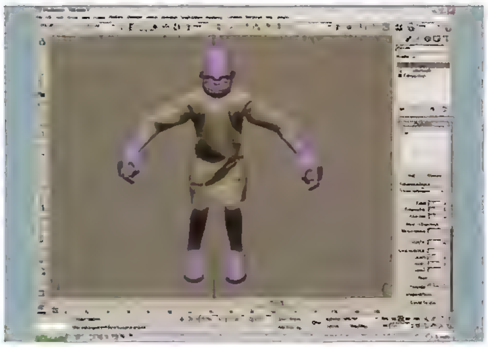
14 Once the shirt has finished moving, switch off Simulate Local and we'll now perform the full thing. Click the Simulate button, and sit back to watch the cloth work itself out. Once the simulation is complete, scrub the timeline to see the material slip and fold around the character. It really is a satisfying process when it all moves in such a believable way.



15 You should quickly see why using a cloth simulation is far better than just relying on a skinned geometric object. The way the mesh hangs and sways is almost impossible to create through rigging or morphing, and the natural slipping around the shoulder and elbow joints makes the unsightly pinching and twisting of meshes a thing of the past.



16 Next we'll add a little detail. If you haven't found this already, go to the Display Panel and unhide the object called Pockets. We'll now add this geometry to the shirt using the Skin Wrap modifier. It's a very easy way to quickly add collars, cuffs and other features without worrying too much about solving more cloth.



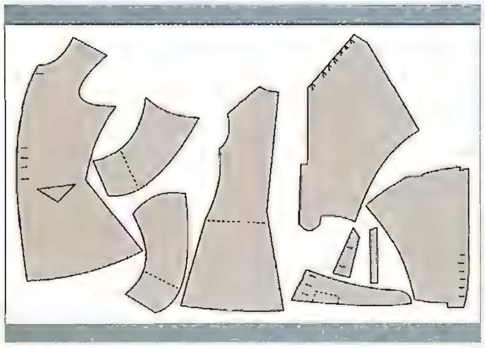
17 Make sure the timeline is back to 0 so that the shirt is in its original state. Select the pockets' geometry, and grab a Skin Wrap modifier from the list. In the parameters section of the Modifier panel, click on Add and select 'Shirt'. Give Skin Wrap a second or two to work it out, and that's it. Scrub the timeline again to see the results.

EXPERT TIP

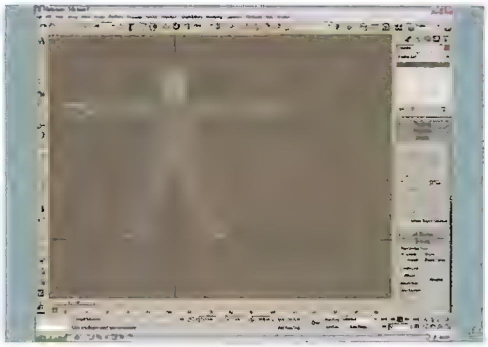
Adding depth

To add instant depth to your cloth, simply apply a Shell modifier. For this Tutorial I recommend setting the Inner Amount to 0.2 and the Outer Amount to 0.0. This will provide sufficient thickness, and stop the geometry from being one-sided; it shouldn't need any segments or bevelling. To add even more detail to your Cloth, simply apply another TurboSmooth on top of the calculation. If need be, drop the Iterations down to 0 and put the Render Iterations up to stop your computer slowing down

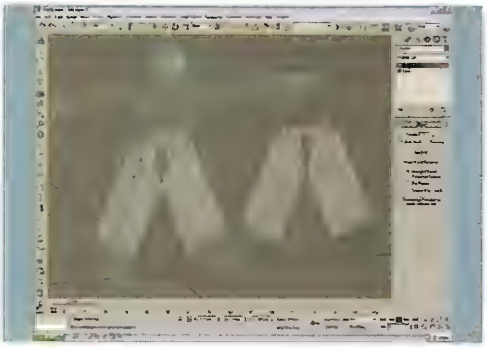
STAGE THREE | Making your own clothes with Garment Maker



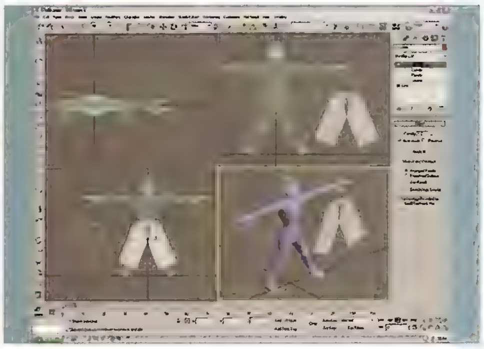
18 To get the most out of *Cloth* you should really make your own clothes using the 'traditional tailoring' method. You're probably aware of the way in which most items of clothing are made up of carefully cut panels - well, *Cloth* uses exactly the same principle for building items of clothing.



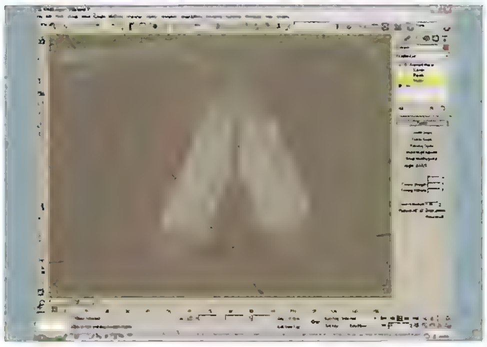
19 To save a lot of time, load the file Cloth_pt3_Start.max from this issue's CD. It contains the alien character with the same rigging and animation as before, plus some spline shapes laid out which will form the basis for a pair of trousers. If you can, get hold of some proper clothing patterns - they'll make this aspect of working with *Cloth* a lot easier.



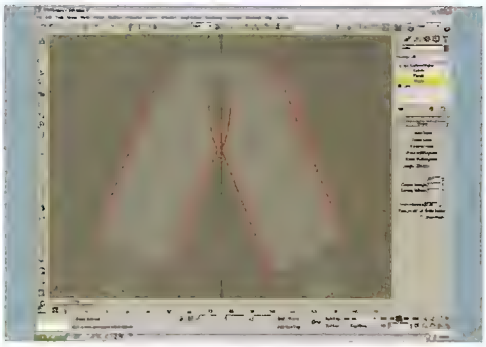
20 The first thing to do is apply the Garment Maker modifier to the panels. Select the Editable Spline object and add the modifier from the list. The splines will become panels with a crazy kind of tessellation across them. This almost random fragmentation creates a more realistic type of cloth than careful quad arrangements. If your PC can handle it, you can increase the density for finer results.



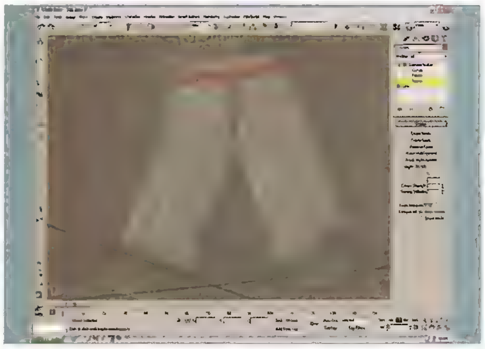
21 Now let's put the pieces in place. Select the Garment Maker sub-object panels, and rotate the three nearest the Alien so they're backward-facing (make sure you maintain the positions - see the grab above). Due to Cloth objects being one-sided, they'll appear to vanish as you rotate them!



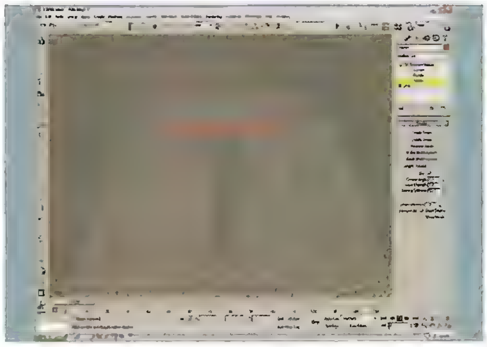
22 Select 'Seams' in the Garment Maker Sub-objects, and select one of the long outside edges of the trousers; it should turn red. Now hold down [Ctrl] and select the matching back-facing edge. Hit Create Seam and the red lines will join the two together.



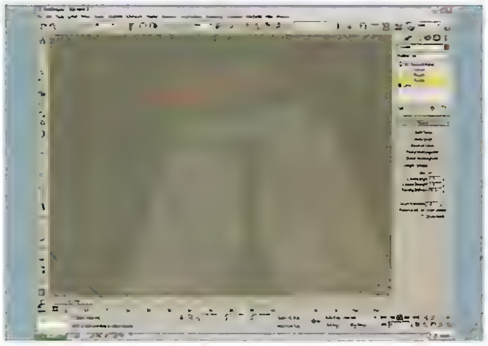
23 Select the other edges as shown in the screengrab and repeat the procedure. Imagine you're sewing these pieces together and you'll understand which bits should connect to which. You obviously don't want to sew up the leg holes, although for now we'll stitch together the zipper area!



24 To attach the waistband to the front leg section you'll first need to create a multi-segment. Select the two top edges of the front leg panels. Click the Multi-segment button to basically make this one long edge. You can now select this edge (and the one on the waistband) and then apply a seam. This may throw up an error or two...

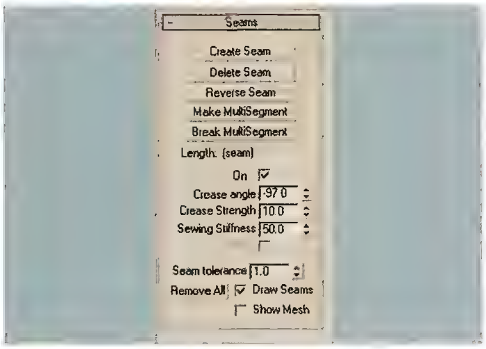


25 The first possible problem is that the seam tolerance may be too low. To fix this simply drag the spinner up to 1.0 and try again. The next problem is that it may mis-read the direction of the seam, producing a series of connecting red lines that cross over each other. If it does this, press the Reverse Seam button.



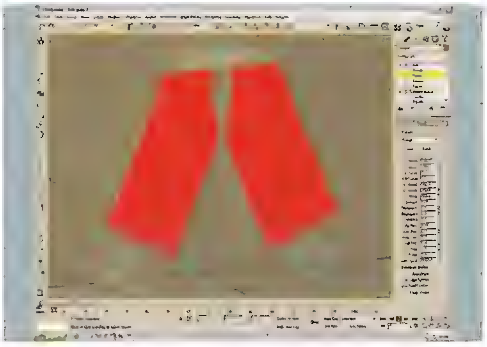
26 Once you've overcome those problems, sort out the back of the trousers where the matching piece of waistband meets the tops of the leg panels. This will no doubt throw up the same errors as before, so repeat the fixes in step 25. Once those seams are complete, we're ready to proceed.

STAGE THREE (Continued) | Making your own clothes with Garment Maker

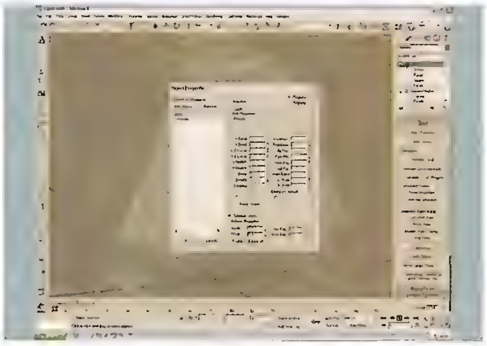


Length: (seam)
On ☑
Crease angle -97.0
Crease Strength 10.0
Sewing Stiffness 50.0
Seam tolerance 1.0
☑ Draw Seams
☐ Show Mesh

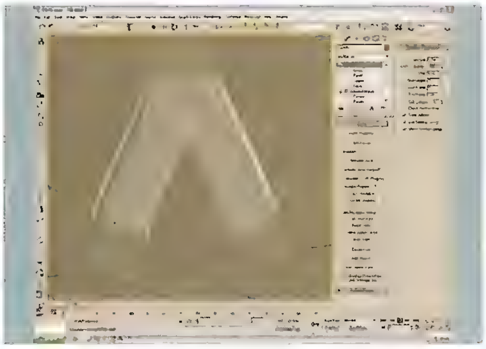
27 While we haven't got time to go into them in detail, it's worth mentioning the Crease Angle, Strength and Sewing Stiffness options that are available in the Seams panel. These settings affect the way in which the cloth object is pulled by its edges. Using these settings you can force the angle of a shirt collar, or simulate that stiff fold of denim that runs down the sides of a pair of jeans.



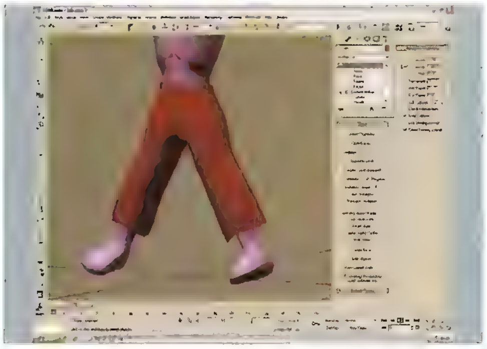
28 We'll now apply a Cloth modifier. Open the Object Properties window and set the Trousers object to be Cloth. This time check the Use Panel Properties box and press OK. Now select 'Panels' from the Cloth Sub-objects and highlight the two parts of the waistband. From the list choose Generic Heavy. Select the four legs panels and choose Burlap from the next list, then drop out of Sub-object mode.



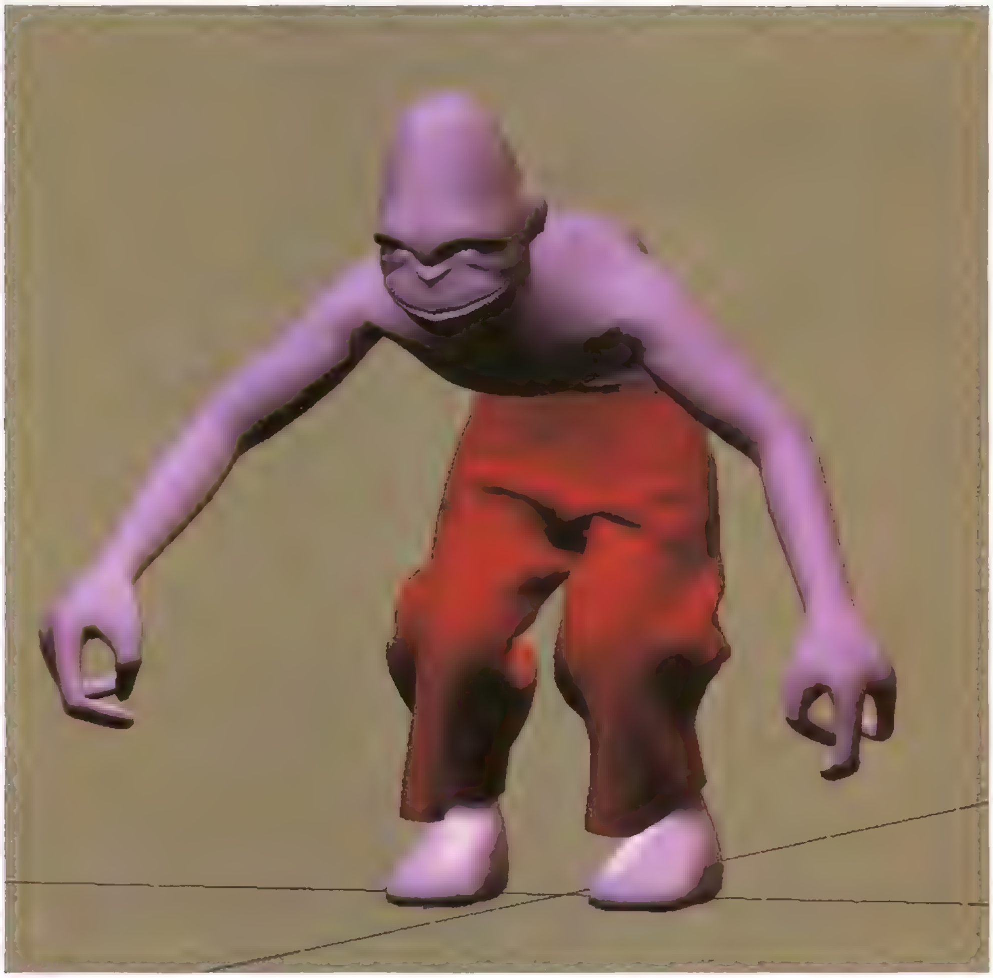
29 We'll need a collision object to wrap our trousers around, so re-open the Object Properties window, select 'Add Object' and grab the Alien. As before, drop the Offset level down to about 0.3 so that the cloth will get a little closer to his skin. With that done, close the window and get ready to do some local simulation.



30 Make sure Use Sewing Springs is switched on, and that Gravity is switched off from the Simulation Parameters. Click the Simulate Local button, paying close attention to what happens. The Panels will move together, forming the trousers. When they're almost touching, click the button again to stop the Simulation. Switch off Use Sewing Springs and then continue using the Local Simulation (damped) button for more control.



31 Let the panels move in until you're happy with their shape. It's sometimes good, at this point, to turn Gravity back on to add a little more natural hang. With that done, we can finally apply the full Solve. Hit the Simulate button to see your garments move with the character's actions. Hopefully the trousers won't come off, otherwise you'll have to make a belt...



32 As before, you can apply a Shell and TurboSmooth modifier to enhance the simulation with some visual depth. While the results you hopefully see before you are impressive, I must reiterate that this is just the basics of clothing creation. But, with these principles sorted out in your head (and perhaps a book of sewing patterns under your arm), you can move on to start creating shirts, dresses, jackets and well-tailored suits. Don't just stop at dressing a couple of characters, however - cloth effects can be used for all kinds of 3D projects: fabric draped over cars in showrooms, loose skin on monsters, dynamic hair simulation and, yes, even the obligatory curtain or flag blowing in the wind. Embrace *Cloth* firmly and you'll quickly find that the fashion world is your oyster. ●

In contrast to the organic cartoon stylings of Blue Sky Studios' hit debut movie *Ice Age*, *Robots* features a dazzlingly detailed world of mechanical creatures and polished metallic surfaces

FACTFILE

PROJECT
Robots

STUDIO
Blue Sky Studios

WEBSITE
www.blueskystudios.com

PROJECT DURATION
Three years

PROJECT TEAM SIZE
200 (approx)

BUDGET
$40 million

SOFTWARE USED
Maya, CGI Studio

ROBOTS

After delighting audiences with an acorn-obsessed squirrel three years ago, Oscar-winning Blue Sky Studios makes a return to feature-length CG with Robots – a leap from the Ice Age into a world of heavy metal

BY MARK RAMSHAW

Blue Sky Studios' $60 million debut feature *Ice Age* had yet to hit cinemas when *3D World* last caught up with Chris Wedge, co-founder and Vice President of Creative Development at the facility. At the time, many wondered whether the studio could really hope to compete with the likes of Pixar and DreamWorks/PDI. In the event, *Ice Age* proved a (ahem) mammoth commercial and critical hit, bagging an Oscar nomination, firmly establishing Blue Sky as a key weapon in the arsenal of parent company 20th Century Fox, and helping to open the floodgates for CG movie production around the world. "*Ice Age* performed much better than we could ever have hoped," says Wedge. "In many ways it created new opportunities for us, and gave us additional creative freedom, but it also introduced further pressures."

> "FOX GAVE US CARTE BLANCHE. SO, IN THE BEGINNING, WE WERE LIKE KIDS LET LOOSE IN A TOY STORE."
> **CHRIS WEDGE, DIRECTOR**

Ironically, those new possibilities also added to the challenge when developing a follow-up movie: "Because Fox gave us carte blanche, in the beginning we were like little kids let loose in a toy store, and ended up making a lot of work for ourselves," says Wedge. Not least by taking the decision to develop a story based entirely in an alternative world. "Before long we realised we'd embarked on a movie where we had to make up absolutely everything in it. There are no regular houses, trees, clouds, mailboxes... nothing you'd take for granted. It took a lot of work and focus to fill in all the blanks and give it relevance."

Robots is a movie that bucks the trend for ever more organic characters and environments. Instead almost every surface is metallic, and every object composed from simple curves and razor-straight angles; the visual charm arising from the retrofuturistic aesthetic, the kinetic animation style, and the lure of the story itself. The plot has young inventor Rodney Copperbottom (Ewan McGregor) heading to the big city in search of master inventor Big Weld (Mel Brooks). There, he falls foul of upgrade-obsessed corporate bigwig Ratchet, resulting in Rodney siding with a band of maverick old robots known as the Rusties, led by the highly dilapidated and ever-unhinged Fender. But with such Hollywood icons as Robin Williams, Halle Berry, Greg Kinnear and Drew Carey lending their vocal talent, one trend that *Robots* does follow avidly is the dependence of CG films on a big-name cast.

The idea of creating a movie about a world populated by robots evolved out of a meeting Wedge had with William Joyce almost a decade ago. Joyce is a celebrated children's author and artist, also well known for the Disney animated series *Rolie Polie Olie*: "We originally met to discuss turning his book *Santa Calls* into a movie at Fox," says

▶

"We ended up bending surfaces in a way that the audience won't consciously perceive," says Blue Sky's Chris Wedge. "[We made] a material that looks like metal, but you get a very fluid, human performance."

Wedge. "We put together a brilliant test, but ultimately it didn't get greenlit. We did become firm friends though, and decided we had to do something together. Initially there was just the idea of a movie about robots, something that simply arose with a fascination about the visual style. We had to spend a lot of time in the sandbox figuring the rest out."

Scripting continued while Blue Sky worked on *Ice Age*, gearing up for full production of *Robots* in 2002, with Joyce on board as Production Designer and Executive Producer, Chris Wedge directing, and Carlos Saldanna once again taking on the role of co-director. For this, as with upcoming projects such as *Ice Age 2: The Meltdown* (which is now in pre-production), the decision was taken to space out production rather than radically expand the studio: "It's not the most elegant metaphor, but I liken it to the way food moves through the body," chuckles Wedge. "One meal is in one place, while food is being processed in another. We can stay at the same size, but still have the resources to develop new ideas."

SUBTLE HUMOUR

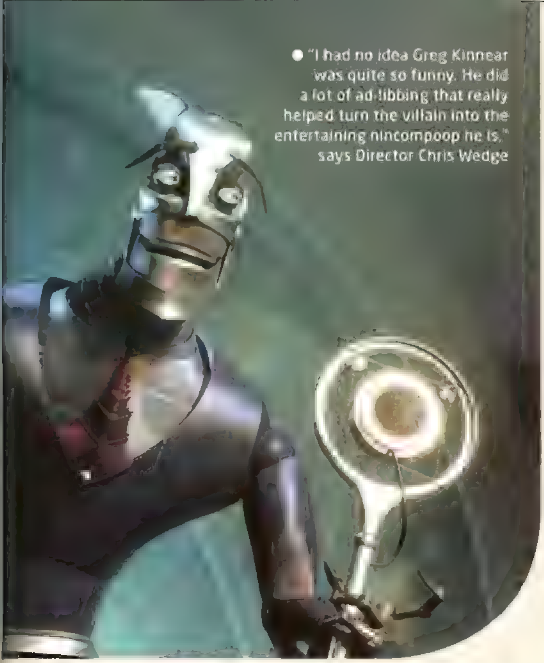
Those who appreciated the rare combination of CG imagery and classic cartoon slapstick in *Ice Age* may be surprised to find that *Robots* takes a somewhat different approach. There's still much visual humour, not least in the manic energy provided by Robin Williams' character, Fender, but there are additional layers to appreciate. But the tone of this one is a little closer to Wedge's heart: "The comedy I love is more sophisticated and subtle. With *Robots* there's still plenty of broad comedy and action, but I think adults will especially engage with it. A lot of the fun also comes from the whimsy of the design, and the situations this new world presents. There's a little bit of a corporate angle, for one thing. Here's a world made up of mechanical objects: effectively things you can buy. At their core, many scenes are related to the idea of self image, and how companies, who profit by what we buy, often sell that [idea] to us. Of course, it sounds a little heavy..." It's also a message in danger of being undermined by the proliferation of *Robots* merchandise (including tie-ins with Burger King, Kelloggs, and Mattel) that accompanies the film's release. "Yeah," laughs Wedge, "which hopefully *we'll* profit by!"

One obvious side effect of the decision to present a world populated by robots is a reliance on potentially harsh angles and surfaces: "It never occurred to me that this might be a problem, because I thought it looked so cool," says Wedge. "But when we started making animations, Fox suggested the hard surfaces might be difficult for people to relate to. They kept giving feedback that the characters seemed too cold and metallic. So we came up with all sorts of techniques, performance based rather than technical, to make them as 'feeling' as possible."

The original intention had been to create models and rigs that were mechanically feasible, but ultimately squash-and-stretch and other deformation tweaks were utilised. "We ended up breaking a lot of rules, bending surfaces in a way that the audience won't consciously perceive, but which gives a more expressive performance that they'll definitely notice. It's a really thrilling result. [We made] a material that looks like metal, but you get a very fluid, human performance with it."

HEAVY WEIGHTS

Casting was another area where Blue Sky had to take Fox's view on audience tastes into account, bringing in the requisite number of Hollywood heavy hitters to supply the lead voices: "These movies cost so much to make that the studio naturally wants to get its money back, and so it's obviously concerned about the public's perception of the film," says Wedge. "Audiences do enjoy the personalities of certain movie stars. You can look at that as a limitation, because we're interested in creating new characters



"I had no idea Greg Kinnear was quite so funny. He did a lot of ad-libbing that really helped turn the villain into the entertaining nincompoop he is," says Director Chris Wedge

> "WE ONLY USED STANDARD TEXTURE MAPPING FOR ELEMENTS SUCH AS THE SIGNS. THE REST IS ALL CREATED PROCEDURALLY."
>
> **CARL LUDWIG, VICE PRESIDENT, BLUE SKY STUDIOS**

But I prefer to see it in the sense that these people have become stars because they're incredible actors."

Ewan McGregor, Mel Brooks and Greg Kinnear all came on board relatively early; their 'weight' making the rest of the casting work – signing up the likes of Halle Berry, Drew Carey, Robin Williams and Jim Broadbent – a little easier. While character, facial and body animation wasn't generally based on that of the cast, Wedge says the actors did have a positive effect on the characterisation and the script itself.

"There were a lot of surprises in terms of how they were able to influence the characters. I had no idea Greg Kinnear was quite so funny, for example. He did a lot of ad-libbing that really helped turn the villain into the entertaining nincompoop he is."

Needless to say, Robin Williams was another actor whose improvisational skills proved useful: "I'd walk into the booth and lay out my meagre offering of the script we'd actually written. He'd read it a few times, nod his head, and then start tearing into it. Half an hour later you'd have something that still existed in the realm of what you intended, but was a hundred times funnier. And in the meantime you'd been given your very own Robin Williams HBO special."

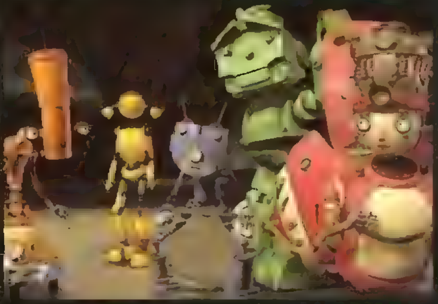
Wedge admits he was initially a little cautious about the idea of using Williams, but believes the character of Fender ended up sufficiently different in terms of look and personality to anything he's previously played or voiced: "I think what you get from Robin is the comic genius and the timing, which in turn prompted us to make the animation even snappier. Often we have to ask actors to say things louder and faster, to add more energy to their performance. You don't have to ask Robin for that!"

SOCIAL COMMENTARY

In the world of *Robots*, the various characters exist in different states of repair. Wedge explains that this provides a visual indicator of where they sit in the socio-economic scale. Older models might be constructed using cast iron, and have engines that spew out coal smoke, for example. Others may exhibit the sort of rusting and chipped paintwork of an old car. And then there are the new models sporting highly polished steel or aluminium surfaces, in the manner of a modern design classic, like a DeLorean or a PowerBook: "Our in-house tools underwent a steady evolution, with improvements made as they were required by the individual challenges of each project," says Wedge. "With *Robots*, we developed programs to generate textures for our robots and environment procedurally, rather than painting them by hand. Using algorithms allowed us to assign a much greater level of textural detail to everything. So, even a robot way back in the crowd has all that visual complexity."

IN FOCUS | Non-Standard Procedure

Blue Sky Studios has always forged ahead with its lighting techniques and use of proprietary rendering system *CGI Studio*. With *Robots*, new methods for adding detail to the characters and environments were also devised: "The first question was how to get the textural richness in there," says Carl Ludwig, VP and Head Of R&D at Blue Sky. "With the amount of surfaces and detail, standard texture maps were out of the question. They would be too labour intensive and require too much memory. So we started to enhance our procedural techniques, developing an efficient way to build detail using a specially developed interface."

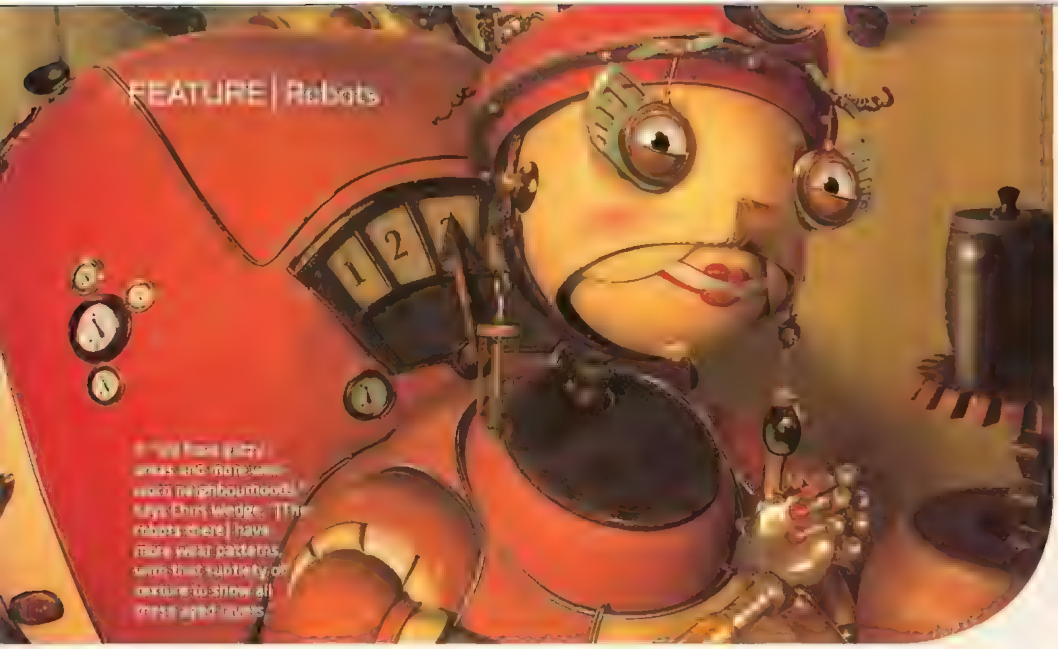


Rodney and his cohorts proudly display their multiple layers of metal, rust and scratch textures, each of which was procedurally generated. "We also discovered nice ways of controlling the texture detail locally," says Carl Ludwig. "The director could ask for just a little more rust in one particular spot, without it requiring a trip back through the paint department. That gave us a huge leap up, as well as letting us work in a world space free of the usual UV heaviness."

"To give a sense of scale, everything was raytracing, and we also used a lot of Global Illumination," says Ludwig. "What that brings to the scene is the subtlety of the way light plays over each surface and creates shadow pools, which really defines the dimensionality of each object. That was extremely important to us, because Chris wanted this movie to look almost like it had been shot, rather than created on a computer."

Build a Baby

Careful lighting also helps give the scenes a sense that they are somehow shot live. "We wanted a lot of controllability, so it was easier to add bounce lights than to employ radiosity," says Ludwig. "If you do everything mathematically correct you have a problem if the director then asks for more light in one particular area. On *Ice Age 2* we're going to be pushing the technology a little more, bridging the gap between the accuracy of radiosity and real controllability."



● "We had gritty areas and more well-worn neighbourhoods," says Chris Wedge. "[The robots there] have more wear patterns, with that subtlety of texture to show all these aged issues."

As Vice President and Director of Research and Development at Blue Sky Studios, Carl Ludwig was closely involved with the creation of the procedural texturing tools, along with a number of other labour-saving techniques. He explains that, in addition to their suitability as an alternative to artist and time-intensive hand-painted texture mapping, procedural techniques also proved invaluable for fleshing out the dense urban landscapes of the film: "If you look at the architectural patterns visible in cities such as New York, you have a number of key buildings that are immediately recognisable, and then more generic architecture covering the spaces in between," he says.

"IT WAS A CHALLENGE TO ENDOW THE CAST WITH STRONG EXPRESSIONS. A LOT OF IT HAS TO DO WITH BODY LANGUAGE." **CARL LUDWIG, VICE PRESIDENT, BLUE SKY STUDIOS**

"We followed suit, modelling a number of 'hero buildings', and then left vacant lots in between in which to automatically place more general designs. Using various construction rules, pseudo-random material assignments, and a complex library of building parts and materials, we were able to efficiently create several unique cityscapes."

"WHAT DREW ME WAS THE IDEA OF A WHIMSICAL WORLD POPULATED BY MECHANICAL PEOPLE, AND THE CHALLENGE OF MAKING THAT REAL." **CHRIS WEDGE, DIRECTOR**

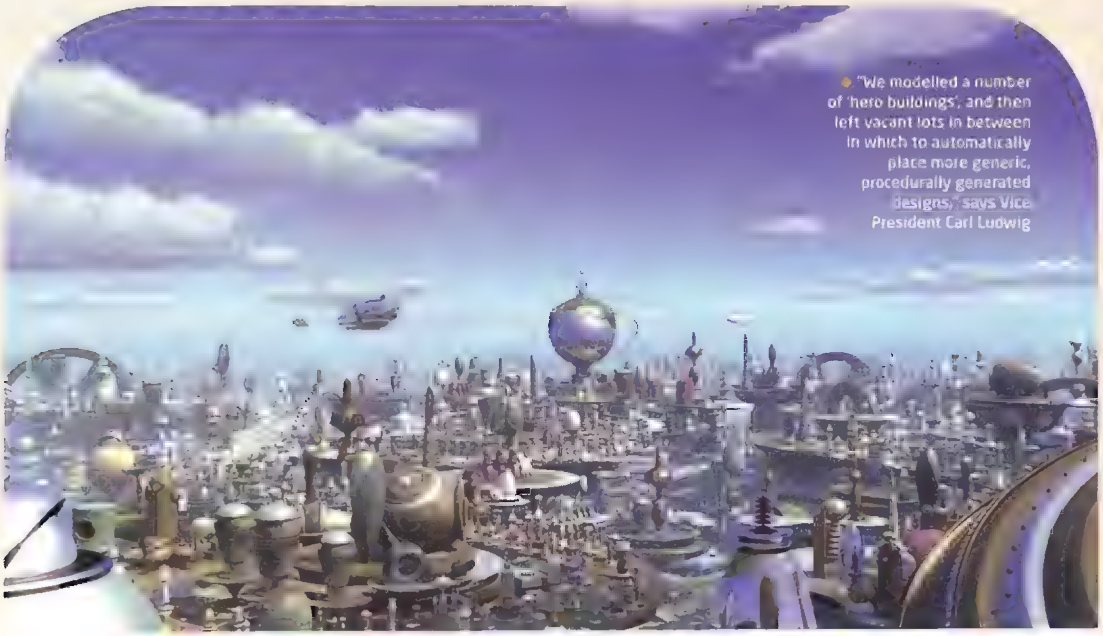
The team used the same approach when it came to creating the tertiary crowd characters. Populating the world of *Robots* with a cast of thousands, it simply wasn't plausible to design each from scratch. Instead base robot designs were generated, which remained true to the quirky tone of the main characters. With their elements then mixed and matched, random elements were applied, and the 'offspring' then grouped into classes: "Different series of walk cycles could then be assigned, depending on the physical stature of the finished character," says Ludwig. "We added some basic intelligence, making their movements goal directed and affected by avoidance capabilities. Actually it was great having to work within the constraints that our ambition and budget created, because it forced us to find creative new ways to solve problems and push our tools much further."

MODEST RENDERS

Given the complexity of the scenes, render times were relatively modest, averaging at 4 - 12 hours per frame (an IMAX version is also to be released, although the team at IMAX were simply able to take the same render files and scale up for the different format.)

"In the beginning, Blue Sky was always very memory-poor, so we've always looked for ways to be efficient," says Ludwig. "Even now we don't have a huge render farm – it's a little under 500 processors. The idea is to render these sorts of scenes in one layer, as it minimises the workload. But we do break things apart when it makes sense, such as when characters can be composited onto a static background. Separate pass layers and separate rendering of characters are also sometimes preferable for flexibility, enabling the director to request a change on just one element or performance without the need to re-render everything."

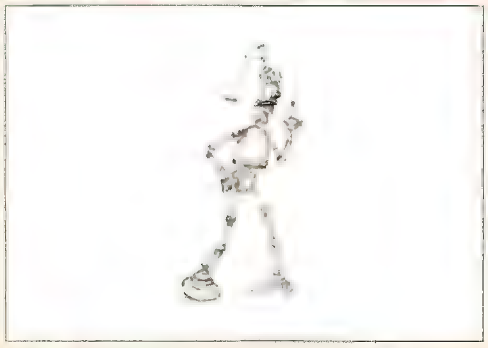
Robotic designs have, of course, been a staple of CG imagery since the days of Robert Abel & Associates' 'Sexy Robot' ad. The conventional wisdom is that metallic surfaces are easier to render than organic ones. Indeed *CGI Studio*, the proprietary renderer created at Blue Sky by Carl Ludwig and Eugene Troubetzkoy, famously demonstrated its powers many years ago when it was used to render a Braun shaver for an advert that looked so photoreal that it was



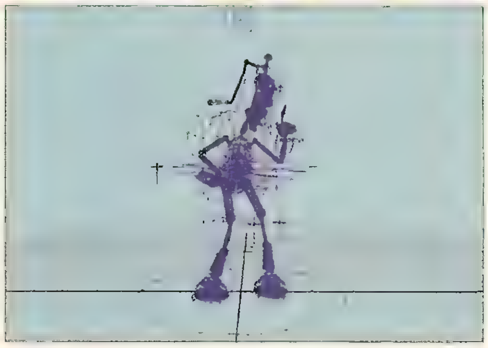
● "We modelled a number of 'hero buildings', and then left vacant lots in between in which to automatically place more generic, procedurally generated designs," says Vice President Carl Ludwig

IN FOCUS | Blue Sky's Carl Ludwig and Chris Wedge on robotic character creation

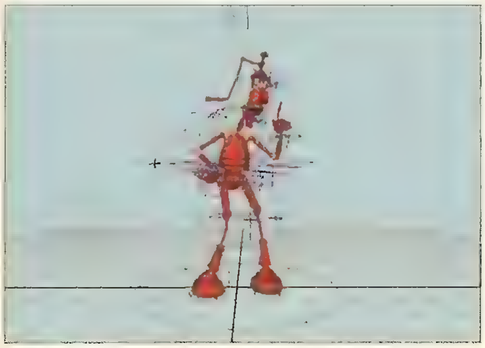
"Robots are well suited for the way we make our images, but the challenge was to give them enough detail that the audience might believe they're real," says Director Chris Wedge. "Our approach was to try to make a film that looked like we'd gone to this fantastic other world and really shot it. It only looks animated in the way the objects are styled, not the way they're rendered."



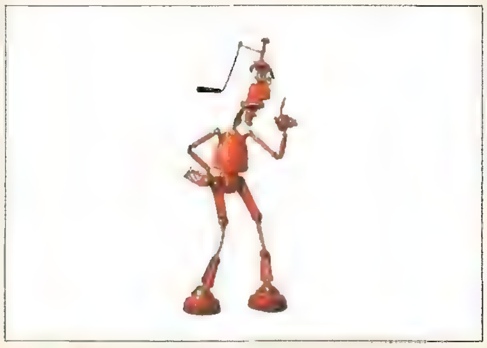
01 This is an early sketch of the character Fender (voiced by Robin Williams). The look of the movie was developed in collaboration with author and artist William Joyce. Fans of his work will recognise a spiritual link between the retrofuturistic design of Robots and the cast of his animated series *Rolie Polie Olie.*



02 "We use *Maya* as our modelling and animation tool, but the actual model files are specifically tailored to our system," explains Blue Sky's Vice President Carl Ludwig. "There's a lot of proprietary software for both modelling and animation in there."



03 Basic shading is applied to the model. Blue Sky Studios favours parametric patch-based models with subdivision surfaces, rather than polys. "We write a lot of plug-ins to help us achieve our very specific rendering quality, getting *Maya* to spit out the models in a form that our *CGI Studio* renderer can use," says Ludwig.



04 "The challenge with the characters was to allow some deformation, but for it not be readily apparent to the viewer," says Ludwig. "It's essential to get expressiveness in the face, for example. The riggers and animators were very clever at finding ways to hide it."

05 Here's Fender in action in the final movie, as rendered by Blue Sky Studio's proprietary *CGI Studio* software. The animators took inspiration from the manic voice performance supplied by Robin Williams. "Robin got a real kick out of the idea of playing a robot that's constantly falling apart," says Wedge.

disqualified from an animation competition (the judges didn't believe the image could possibly be computer-generated). Yet Ludwig says the need to render scenes featuring robots and environments built from metal posed a number of challenges: "You've got all kinds of extraordinary specular and diffuse interactions to simulate. And having a lot of bright highlights all over the place always presents a challenge when raytracing. As with work we've done in the past, where we've had people think it must be Claymation or puppet animation, we wanted to strive for a real sense of dimensionality."

Ludwig says this sense of dimensionality was achieved in the film using *CGI Studio*'s raytracing, with a combination of Global Illumination and some careful placement of bounce lights: "We like to light our scenes in the same way that live-action directors do," he explains. "Even in an outdoor shot, a live-action director will use a large screen to light the actors' faces, and we set up our scene lights in a similar way. A big part of getting the right look for the film was also in the shadowing.

"We developed some really nice techniques based on the Monte Carlo sampling method, not only looking at lighting distribution but also the relative importance of each light's contribution. You can think of it as ambient shadowing in conjunction with bounce lighting."

There's little doubt that Blue Sky's technical prowess is just as crucial to the appeal of *Robots* as the otherworldliness of the William Joyce visual tone and the performances by the starry cast. "The biggest challenge was to be able to work on a world so inherently complex, doing it in an effective manner and without making any compromises in quality," says Ludwig. "Given the budgetary constraints, it just wouldn't have been possible to create such a rich world – one far more complex than *Ice Age* – by relying on standard CG movie techniques. And by developing new techniques, we've been able to make a movie with a richness that actually makes it hard to see how it's been created. I think it looks extraordinary."

***Robots* premieres in cinemas in the USA on 11 March 2005, and other major territories (including the UK) a week later. *Ice Age 2: The Meltdown* is currently scheduled for a March 2006 release. Visit the official Robots website at [w] www.robotsmovie.com**

● A helicopter flight over an African [illegible] sets the sc[illegible] spoof *Monkey Dust* episode *They All Come Home*

Luke Carpenter

BBC3's Monkey Dust is a cult late-night animated comedy sketch show that's distinctly adult in its approach. We spoke to animator Luke Carpenter about his role in the award-winning series **BY BEN VOST**

● *LightWave* was used for effects work as well as modelling but, here, the heat haze was generated by *After Effects*

● The rough-drawn look of the animation in *Monkey Dust* echoes creators' Harry Thompson and Shaun Pye's vision

Tell us about yourself...

After completing a fine art degree in Sheffield and spending some time working in a camera shop, I moved to London and worked as a Technical Assistant at Sherbet Productions (www sherbet co uk) I then moved up to Technical Manager and got opportunities to animate and composite on *Monkey Dust*, *Girls in Love*, and some Kotex and Persil ads. From there I decided to go freelance, but still return to Sherbet to do more *Monkey Dust*, and any other projects they may need me on.

When did you see LightWave 3D for the first time?

About four years ago, at Sherbet, I started using it casually for simple backgrounds and so on. Then I worked on a short pilot called *Mr Macaroni*, taking over where another 3D artist (my friend Adam Sharp) left off I got a good grip on the program after reading the manual, picking through Adam's files, and some late nights

When did you first start using it?

The first commercial job I used *LightWave* for was in series two of *Monkey Dust*. I worked with the director Tim Sagar, combining 3D backgrounds and props with his 2D animation. He has a great flat cartoon style, and I found *LightWave* perfect to blend the 3D and 2D together. A combination of edges, cel-shading, some textures and clip maps made this pretty simple

What do you like about the package?

I love Modeler – it's so fast and tactile. It's the most artist-friendly and expressive of all the 3D modellers out there; the new dynamics are great, and area lights are simply beautiful. It's a reasonably priced, complete package I doubt there's anything that beats it.

What spec machine(s) are you using it on at the moment?

A Pentium 4 2.2GHz self-build, with 1GB RAM and a SCSI HD.

As you're compositing with Flash animation, have you thought about outputting your LightWave stuff to Flash using the Electric Rain plug-in?

Unfortunately, the *Swift 3D* plug-in isn't too good for this sort of thing as it doesn't support textures. It can also be slow and gets confused on large scenes with lots of objects. I used it a bit on series two of *Monkey Dust* to render out some cars for other directors' sketches, so they could drop them straight into their *Flash* animations.

● Although the models and texturing are pretty simple in this scene from *Monkey Dust*, the overall look on-screen is very effective

● All the planes and buildings created for *Monkey Dust* are *LightWave*-originated, making for a good mix of 2D and 3D

How long have you been working on Monkey Dust?

I've worked on all three series' of *Monkey Dust* – I got my own sketch, initially doing 2D in *Flash* in the first. I also had the task of compositing most of Sherbet Productions' output in *After Effects*. Then on series two and three I started to add 3D elements to the *After Effects* stage. There are usually at least four other directors working on sketches at Sherbet, so I do a bit of 3D and *After Effects* for them too.

Tell me about the style of Monkey Dust and the sequence you directed?

The overall style of *Monkey Dust* is set by the designs of the Art Director, Andrew Rae. His style is a loose realism, using photos and defined lines. The style allows a fast and loose approach re-using photo textures and rotoscoped line art. Rae's designs are somewhat different. They don't have a line and have a more stylised look.

The sketch 'They all come home' is basically a pastiche of *Black Hawk Down* – for every *Monkey Dust* series, the writing team write a script that sends up a Jerry Bruckheimer movie. But the Bruckheimer-pastiche sketches aren't actually set in the '*Monkey Dust* world,' as they're films shown in that world. When I've worked on other sketches, there are definitely more set parameters and visual signifiers in '*Monkey Dust* land'. Certainly with this project the comedy is more effective if you don't refine and polish every section of animation, or fuss with detailed illustrations. You have a point and an angle to make in the script, and the real skill is achieving that efficiently. When it comes to doing 2D combined with 3D, you have to make sure you keep the camera moves pretty basic or you'll notice the flat characters.

Some of the animation for Monkey Dust is 2D, and some is 3D. Who did what?

The 2D was animated and illustrated by Damian Fox and I did all the 3D and compositing.

What did you build in 3D for the sketch?

Everything apart from the characters and a few props is 3D so I had to build helicopters, planes, buildings – all kinds of stuff.

How long did you work on it?

About four and a half months in total. I spent the first three weeks making the animatic and modelling the standard elements: for example, the helicopters, buildings, and so on. The characters were already designed from previous episodes.

The next three months were spent breaking down animatic into scenes, creating the 2D animation (characters already drawn and set up in *Flash* from the previous series), building and rendering scenes and finally compositing the 2D with the 3D elements. Then we spent the last month tweaking the edit, and making any changes proposed by [series creator and writer] Harry Thompson. None of the modelling was too hard as the poly count had to be low for rendering reasons, and there isn't much need as most objects are in the background. Everything was rendered on one Dell Precision dual 2.8GHz machine with 2GB RAM.

Some of the scenes, particularly the hotel scene, had a lot of objects in them so it was very slow to work with. It would have been nicer to have had more time and a render farm, then the scenes could have been more complex and detailed. But to be fair, this isn't really in the spirit of the series as a whole. I didn't spend much more then two or three days modelling any of the objects. The textures were very basic, too.

How do you and Damian Fox work together?

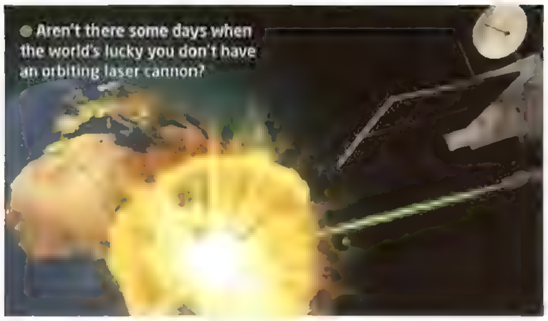
Damian takes the script and draws up the animatic in *Flash* so that we then have an excellent guide for timing, and so on. After that, I break down his animatic into scenes and drop it into *After Effects*. Then we start animating, laying on completed scenes as they're finished. Next, Damian provides me with completed 2D sections as PNG file sequences. I take these and combine them with the 3D, adding other effects in the compositing. Eventually it all shapes up to the final piece.

Do the writers just give you a script and let you get on with it?

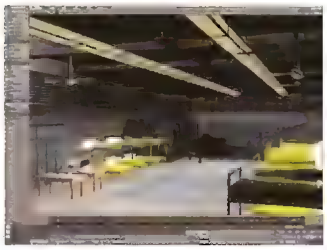
After you get the script and put together an animatic, you can suggest changes to Harry Thompson. Then, after a few versions and tweaks, the animatic finally gets the green light and you can start animating. But obviously, with 3D, I can start modelling right away.

What are you working on now?

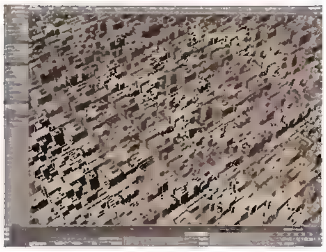
I've just finished two jobs: one was for the science program *What We Still Don't Know* on Channel 4, for Hipster Medium, and the other a title sequence for a kids' show called *The Fugitives*, for Voodoodog and Shed Productions. I am currently working on a few pitches, and some of my own work. ●



● Aren't there some days when the world's lucky you don't have an orbiting laser cannon?



● The barracks get a lot of use in the sketch so they needed to be a little more detailed than the other models



● An overview of Freeville, the city from Monkey Dust's 'They all Come Home', seen from a *LightWave* perspective

● Contrary to appearances, this cemetery scene from 'They All Come Home' was not inspired by *Cannon Fodder*...

MORE INFORMATION

Monkey Dust is shown on the UK's BBC3 on week nights. You can see more of Luke's work at his website:
[w] www.itchyteeth.com

ABOUT THIS ADVERTORIAL

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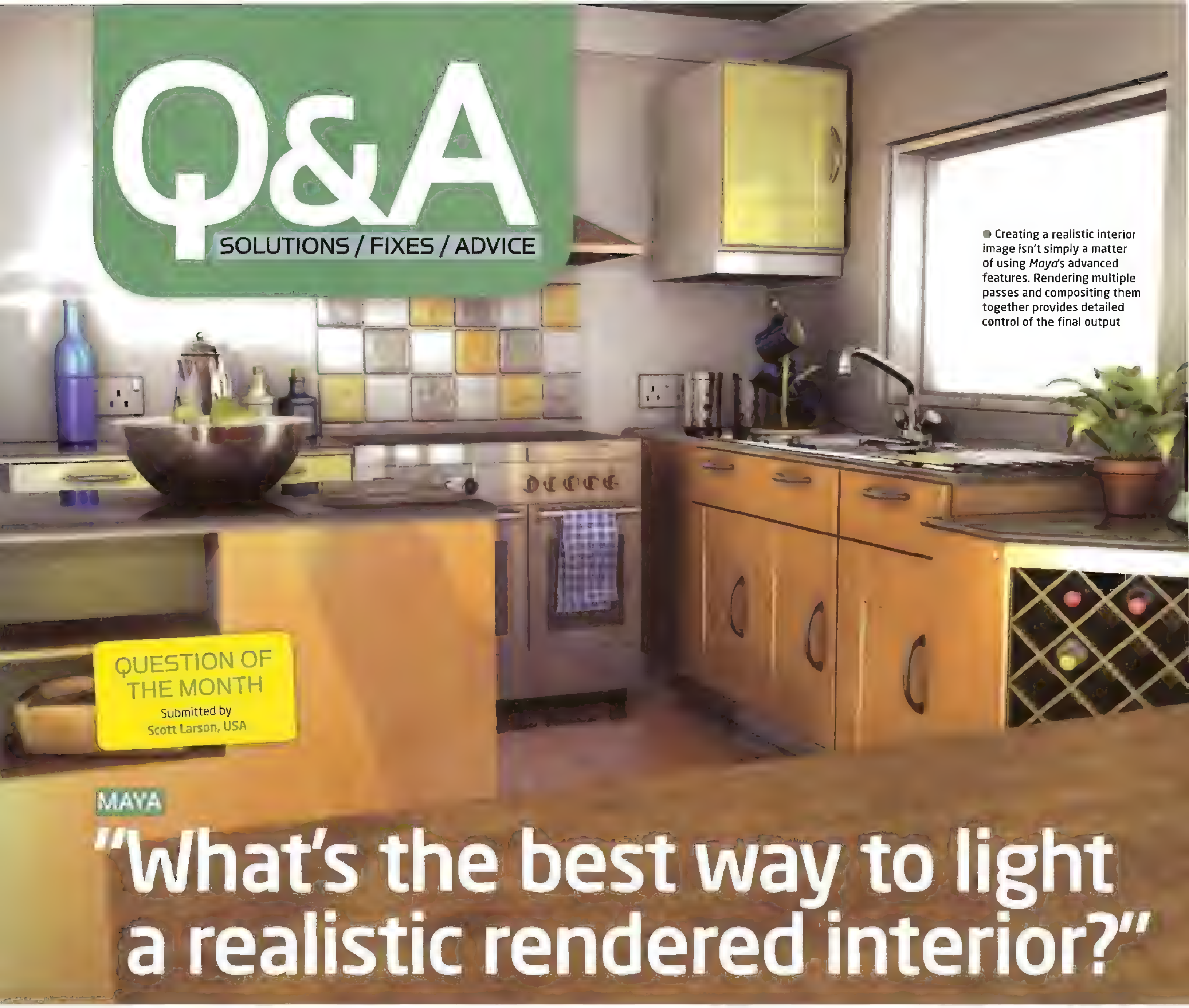
[w] www.newtek-europe.com

Q&A

SOLUTIONS / FIXES / ADVICE



● Creating a realistic interior image isn't simply a matter of using *Maya's* advanced features. Rendering multiple passes and compositing them together provides detailed control of the final output

QUESTION OF THE MONTH

Submitted by Scott Larson, USA

MAYA

"What's the best way to light a realistic rendered interior?"

FACTFILE

FOR
Maya 6 and After Effects

DIFFICULTY
Intermediate to expert

TIME TAKEN
A working day

ON THE CD
- Start scene
- End scenes for depth occlusion and so on
- Texture map
- Rendered frames
- Alternative scene file (MayaComp.mb)

ALSO REQUIRED
Dirtmap shader plug-in by Daniel Rind (on the CD)

This issue's answer is supplied by Gary Noden, who works for production company 422 Manchester. He spends his spare time staring into the dark corners of his kitchen, wondering why his real pears don't look real any more

"Everybody wants photorealism these days. If I had a bar of chocolate for every time a client has said to me 'I want it looking photorealistic,' I'd be a very fat man . OK, an even fatter man. As the years, and the films, progress, the plug-ins keep coming to help CG artists get closer to this Holy Grail. The trouble is that 'photorealism' and 'realism' are two different things. If you were to stand in the corner of your kitchen and look at it with all the lights on, do you think it would look like a spread in *Ideal Home* magazine? Not a chance. In fact, it would probably look a bit drab, with too many shadows and not enough colours. In magazines, kitchens are bright and colourful; the chrome is stunning, the surfaces all too tidy – obviously, nobody's concocted a chicken fricassee on *that* hob! The irony of photorealism is that it's not real at all – photographers spend hours pre-lighting to remove shadows for magazine shoots.

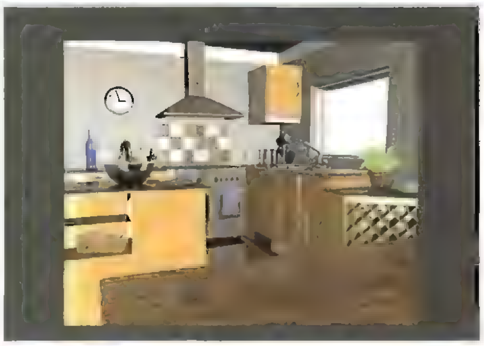
So, how do we create a photorealistic kitchen using the tools at our disposal in *Maya*? Well, everybody's first solution now is to play the *mental ray* card, but we did a pretty good job before Global Illumination, Final Gathering and caustics came along. We did something that most people still do today: compositing. We rendered lots of different layers and then combined them in a compositing package. This way, shadow, colour and intensity can be adjusted on the fly, light flares and film grain can be added, and so on.

MENTAL AGILITY

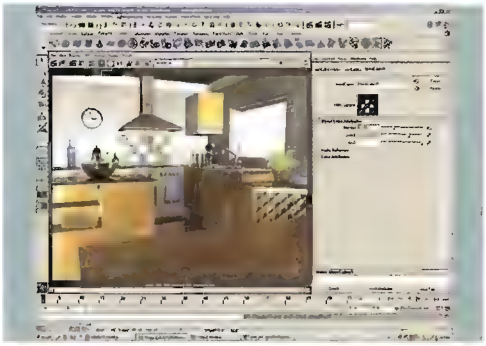
However, *mental ray* does supply us with some elements that previously required a lot more rendering power. Bounce lighting, often called radiosity, comes from Global Illumination. An occlusion pass, or a global shadow pass, can be created relatively quickly now, using a *Softimage|XSI* shader called *Dirtmap*, converted by Daniel Rind. You can find all the relevant data to install it on this issue's CD, along with the scene files and texture maps for the walkthrough.

We'll take a pre-built scene (included on the CD), make copies and render out various versions of the same image, and then combine them in *After Effects*, to create – hopefully – a photorealistic image"

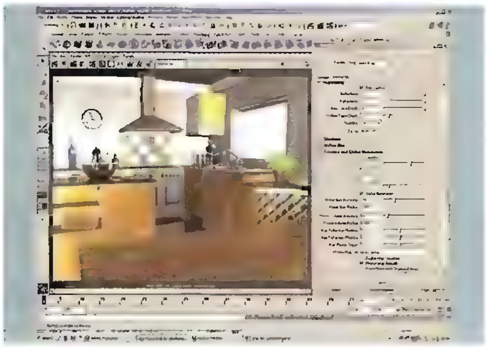
STAGE ONE | Let there be light!



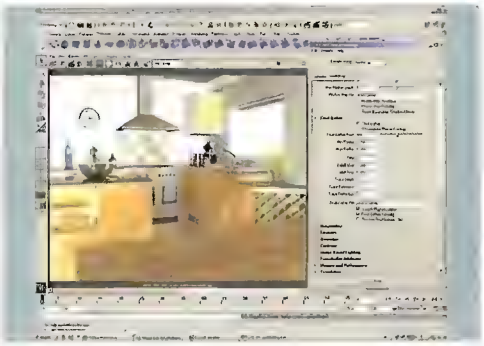
01 Open Shot01.mb from the CD. Not all the objects have *Maya* shaders, so it can be rendered primarily in *mental ray*. Render off a frame. Okay, let's begin 'real-ifying'. We're going to add a gobo to spotlight2's colour to make the light a bit more interesting. Turn off the raytracing and render an IPR frame.



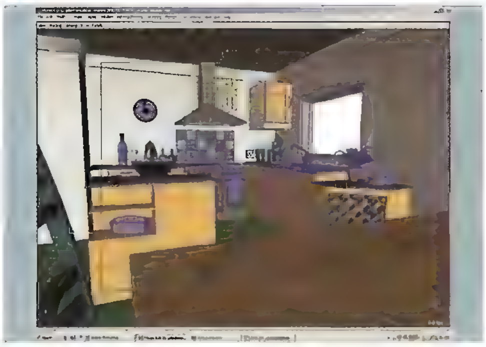
02 Open the Attribute Editor of spotlight2 and click on the Color checkbox. In the Render Node window, open the Utilities tab and click on the blendColor button. Set color1 to a pale grey and color2 to a white, with a Value set to 1.2. Now assign a 2D noise texture to the blendColor's blender. Edit its values until you're happy, or open shot02.mb.



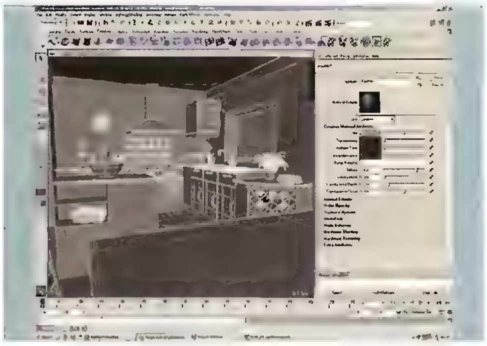
03 Let's add bounced light with Global Illumination. Turn on the Emit Photons option in the scene's two lights. They're both set up for this Q&A, but edit the Photon Intensities if you want. Turn on Global Illumination in the Render Globals and set the quality to 256. Click on Enable Map Vizualizer and type in a Photon Map File. Render.



04 Now turn on the Final Gathering and its Map Vizualizer. Set the rays to 400 and render your scene again. Notice how there's some green spill from the plant on the wall. Nice. Now tweak the values until you're happy, then turn off the rebuild flags on Global Illumination and Final Gathering in the Render Globals; this speeds up the renders no end!

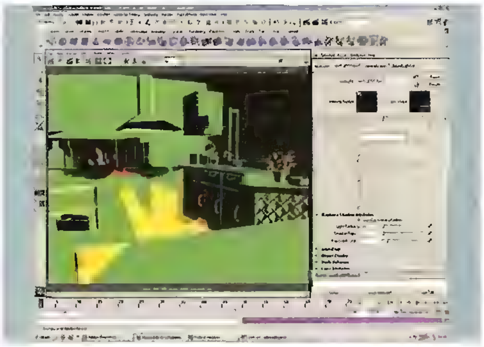


05 Look at your scene. Don't worry about the sudden addition of lots of white and yellow dots; these are a visual representation of the photon maps you're reusing. Edit any material values you like until you're happy with your results (I changed the wall colour!) and then render off a final version, saving it as colPass.tga, as we'll use this one as the colour pass for your composite.

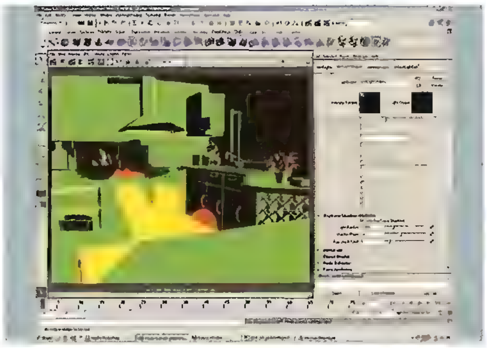


06 Save your scene as colPass.mb. Now save it again under the name shadPass.mb. Select your chrome shaded objects and set their Receive Shadows Option to 0. Turn off all Global Illumination and Final Gathering settings. Now select every object in the scene and assign a new lambert shader, rename it shadMAT, then delete all your unused shaders in your Hypershade.

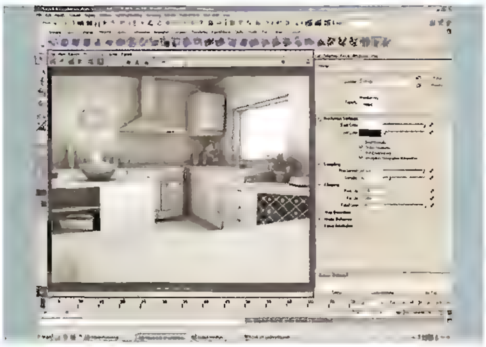
STAGE TWO | Colourful shadows



07 Select spotlight1. In the Attribute Editor, set its colour to 0, intensity to 1 and shadow colour to green, then ramp the green's HSV Value to 100. Break the colour connection in spotlight2, setting colour and intensity as above, but set the shadow hue to red. Now open shadMAT and set the colour to 0.1. Turn on each light's raytrace shadows option. If you render this frame, you'll see red, green and yellow shadows.

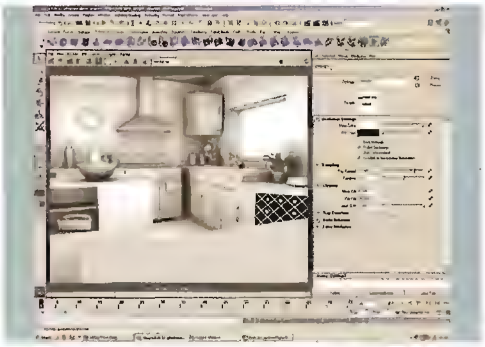


08 This image holds two shadow references. In a compositing app, you can isolate either red or green to use as a mask to create shadows over your colour pass. Let's remove these unreal hard edges. In the Raytrace Shadow Attributes of spotlight1 set Light Radius to 0.5 and Shadow Rays to 16. In spotLight2 set Light Radius to 0.2 and Shadow Rays to 16. Render. Save the result as shadPass.tga.

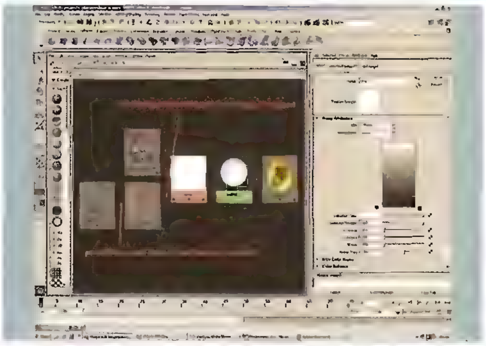


09 Save your scene as dirtPass.mb. Turn off the shadows in your lights, select your shadMAT material and refocus up its chain to the Shading Group node. Under the Mental Ray rolldown, click on the material checkbox. Dirtmap should be at the bottom of the Render Node window that pops up. If not, re-check your installation. Render your frame, and go "Aah..." at the results.

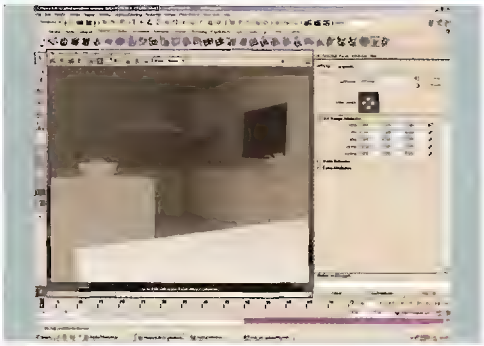
STAGE TWO (Continued) | Colourful shadows



10 Set the Dirt map's ray depth to 64 and its ray spread to 70; this gives a slightly harder edge to the proximity information, but gives us values we can 'crush' in the composite, and a smoother render - the choice is yours. Render the image, and save it out as dirtPass.tga. This will act as our occlusion pass in future steps.

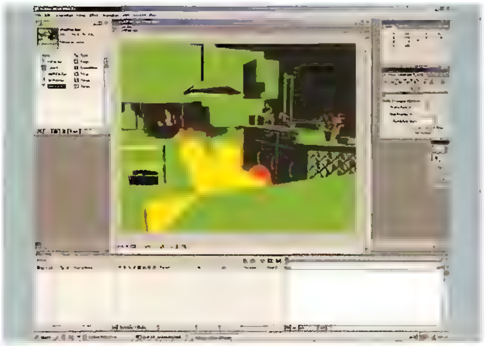


11 The next thing to do is turn off all raytracing and hide your lights. Now change the render engine back to Maya Software. Save your scene as scene_Depth.mb and reapply shadMAT to all your objects. Set shadMAT's colour to black, and map a 2D ramp to its incandescence. In the Hypershade, create a setRange and connect the outValueX to ramp1.uCoord.

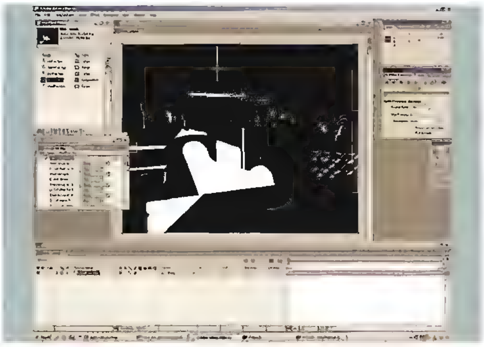


12 Create a samplerInfo node and connect its pointCameraZ into the setRange1.valueX. Set the setRange min and max to 0 and 1 respectively; this represents the V co-ordinate's range. Set the oldMin to -20 (20 units from the camera) and the oldMax to 0 (the position of the camera.) Render a frame; this should look like a Z-depth map, but render quickly. Save the image as depthPass.tga.

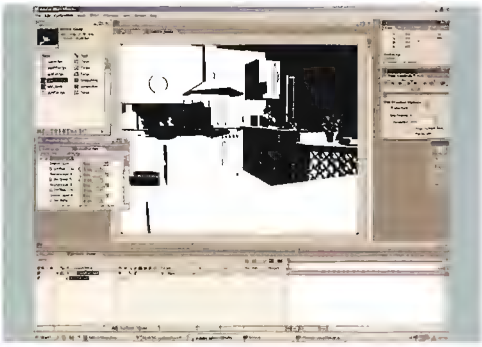
STAGE THREE | Making passes: using After Effects



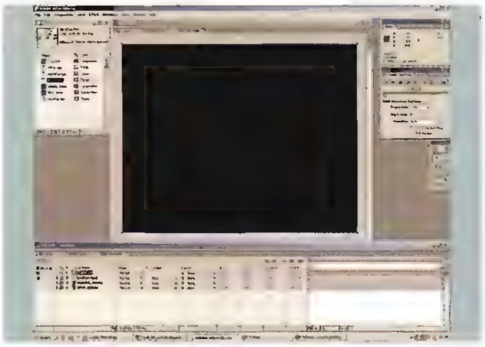
13 OK, you should now have four images: a colour pass, a shadow pass, an occlusion pass and a depth pass, all 720x576 - standard D1 PAL television resolution. Open a new project in *After Effects* and create a single frame composition with the same resolution as your images. Load in your images. We'll now create a variety of compositions called precomps, which we can use to create our final image.



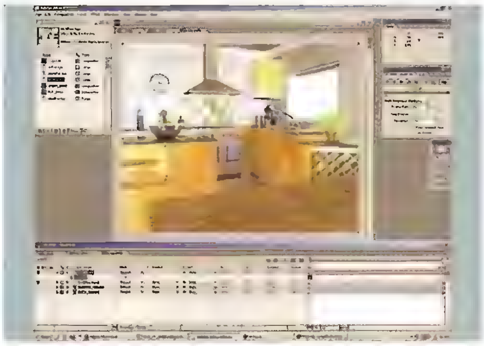
14 Make a new composition in *After Effects* - call it RED SHAD. Drag the shadow image into the timeline and from the effects menu add a Set Channels effect. Change all of the source layers to red, and you should now see a white representation of your red shadow.



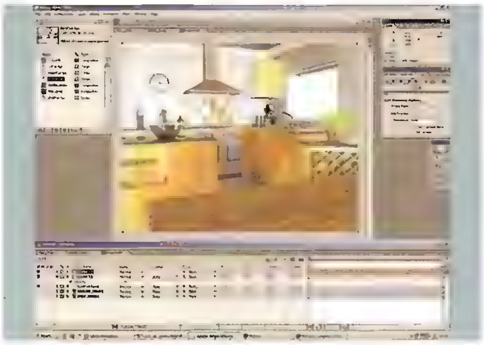
15 Duplicate this composition, rename it GREEN SHAD and change the source layers in the shadowPass Set Channels effect to green. As primary colours can be split out of each other you can render up to three shadow passes (red, green and blue) in one pass, and separate them later. This can save you a lot of rendering time, as well as disk space.



16 Now create a new composition, and call it COLOUR. Drag your colour image into the timeline, and then create a dark blue Solid (Layer > New > Solid) above the colour pass. Now drag in your precomp GREEN SHAD under the colour pass. You'll use this as a mask for one of the colour passes, but we don't want to see it, so click the video eye off.

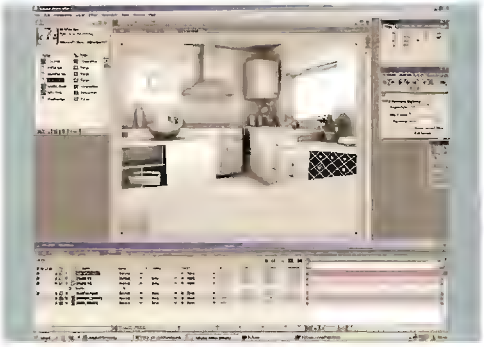


17 In the Solid, apply the Effect > Channels > Set Matte. Set the take Matte From to GREEN SHAD. Change the layers mode from Normal to Darken. Tweak the value of the layer's opacity until you have a very small difference between shadow and your original colour.

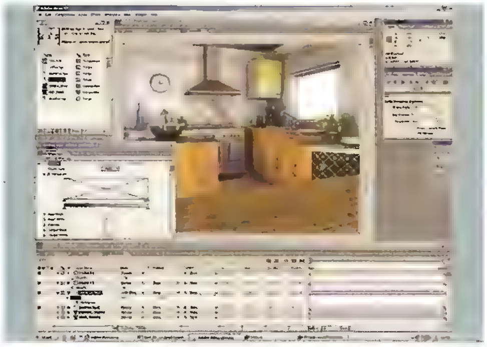


18 Now add the RED SHAD to your timeline, duplicate the Solid to create your red shadow pass and, in its Set Matte, change the source to RED SHAD. As both of these images are set to Darken, they create an additive darkness in your render. Tweak the opacity again until you're happy with the results.

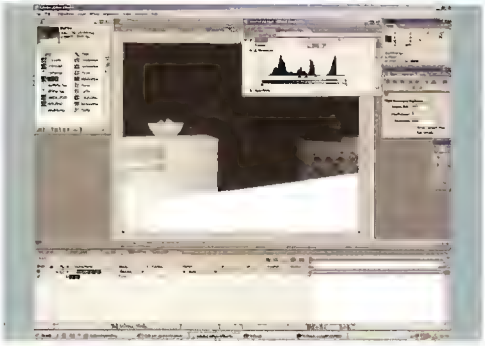
STAGE FOUR | Making passes: occlusion passes



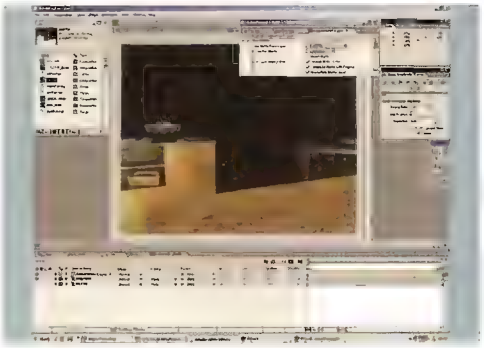
19 Drag in the occlusion image. Notice that you can't see it; this is because *mental ray* doesn't render a supported alpha with *Dirtmap*, so you need to change how the image is interpreted. Select your occlusion pass, and press [Ctrl]+[F] to open the Interpretation Panel. At the top, set the Alpha to Ignore. Now you can see your occlusion pass.



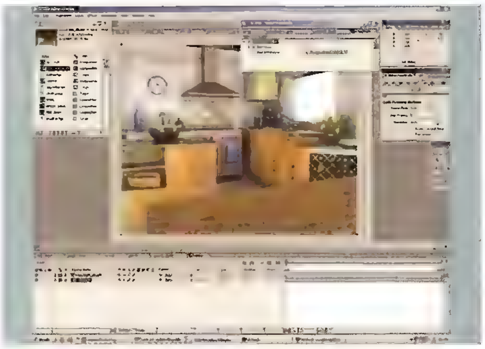
20 Now move it to just above your colourPass. Set its layer mode to Darken. That's too dark, so reduce the opacity to about 85 and add Effect > Adjust > Levels and 'crush' the gamma *until* it's about 0.05. Now add an HSV effect to the colPass.tga below it, and raise the saturation a little to put some colour back.



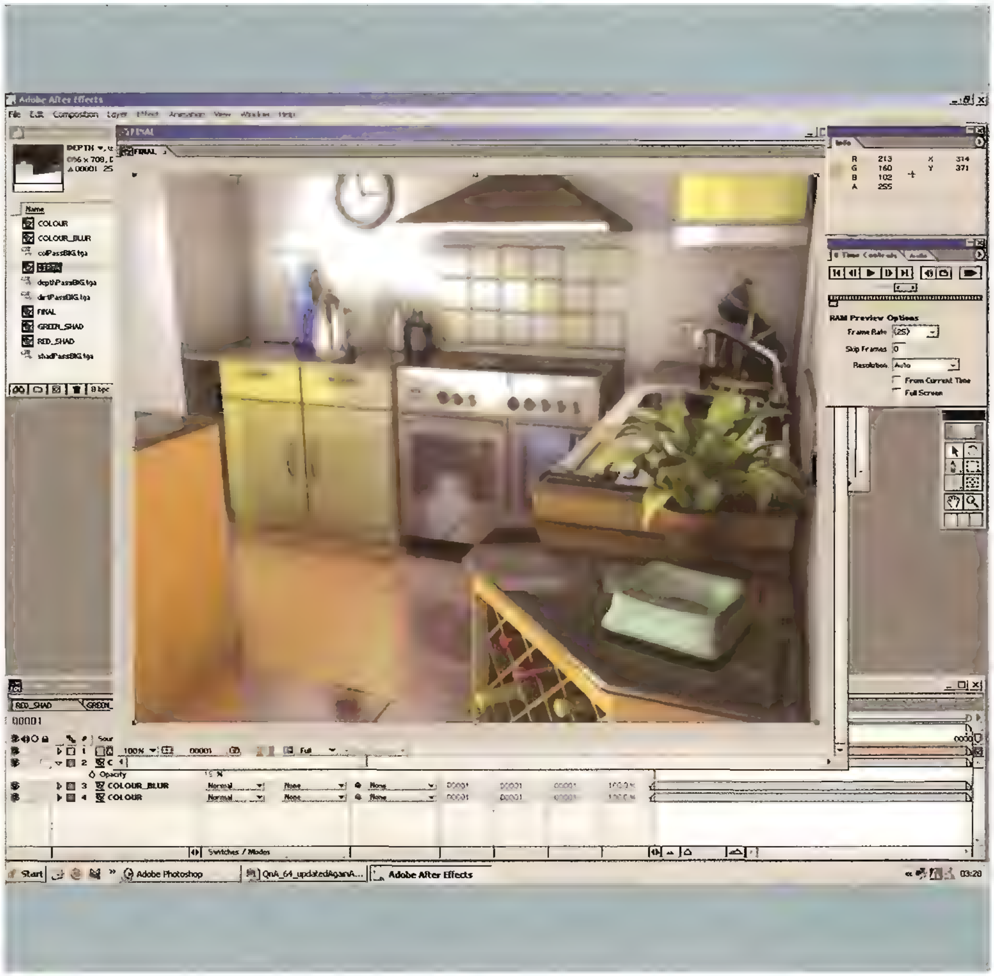
21 Create a new composition and call it DEPTH. Drop the depth image into this. Go to Effect > Adjust > Levels. When you change the values, notice how you can crunch the luminosity in and out. If you were to just add this effect to the depth pass in the colour comp, you couldn't use the resulting luminosity to affect the other layers, hence the pre-composite here.



22 Now, make a new composite and rename it COLOUR BLUR. Drag and drop the DEPTH comp into the bottom of this comp, followed by the COLOUR comp. Now add an adjustment layer at the top. This affects everything below it in the timeline. Apply to it an Effect > Channels > Set Matte and then set its source to DEPTH comp's luminance.



23 Almost there! Now create a new comp called FINAL COMP and add COLOUR and COLOUR BLUR to it, making sure that COLOUR BLUR is on top. Add a Gaussian blur to *it* and raise the value slightly – around 4 is *good*. Add one to the COLOUR precomp and set it to 0.2. Real photographs don't have the sharp edges of CGI, and a little softness helps no end.


Adobe After Effects
File
Edit
Composition
Layer
Effect
Animation
View
Window
Help
FINAL
DEPTH
Name
COLOUR
COLOUR_BLUR
colPassBIG.tga
DEPTH
depthPassBIG.tga
dirtPassBIG.tga
FINAL
GREEN_SHAD
RED_SHAD
shadPassBIG.tga
8 bpc
Info
R 213
G 160
B 102
A 255
X 314
Y 371
Time Controls
Audio
RAM Preview Options
Frame Rate
Skip Frames
Resolution
From Current Time
Full Screen
RED_SHAD
GREEN_
00001
100%
Full
Opacity
COLOUR_BLUR
COLOUR
Normal
None
Switches / Modes
Start
Adobe Photoshop
QnA_64_updatedAgainA...
Adobe After Effects
03:20

24 To finish, add a glow and film grain. Drop in your COLOUR pass again at the top, and set its layer mode to Add. Add the effects: Adjust > Hue/Saturation, Adjust > Levels, and a Gaussian Blur. Desaturate it a little, crush the colour to its highlights, and then blur the result. Set the transparency very low and you should have a passable threshold glow. Add a noise adjustment layer over everything.

Now experiment with the scene: try different camera angles, as shown above. Bear in mind that you don't need to have compositing software in order to composite images: you can combine images quite easily in a Layer Shader. You can also use blendColors nodes, using colour values as blenders, if you want to tweak the tonal values of your *Maya* Composite – see the MayaComp.mb file on the CD.

Forum | Post your Maya queries at http://forum.3dworldmag.com

Q&A

Our experts this month...

3DS MAX

Pete Draper is VFX Director at Lightworx. He often wondered when those misspent days in metalwork would bear fruit
www.xenomorphic.co.uk

BRYCE

Kirk Dunne is a freelance artist, and has served as Renderosity's *Bryce* Moderator for the past three years
www.agentsmith.tk

CINEMA 4D

Adam Watkins is the Director of Computer Graphic Arts at the University of the Incarnate Word in San Antonio, Texas
www.cgauiw.com

CARRARA

Mike de la Flor is the author of *The Digital Biomedical Illustration Handbook* and *The Carrara Studio 3 Handbook*
www.delaflor.com

EIAS

Lance Evans is author of the *Maya | Multipass Rendering MediaBook* and *Professional 3D With Electric Image Universe*
www.3dny.com

FORM•Z

Martyn Horne is Technical Director of STEM Ltd. He's been using *form•Z* for over ten years, and is co-author of *Learn form•Z*
www.stem3d.com

LIGHTWAVE

Benjamin Smith is director of Red Star Studio, a creative digital film production service based in Sheffield
www.redstarstudio.co.uk

MOTIONBUILDER PRO

Chris Ollis works as a character artist and animator for Codemasters, and is a regular contributor to *3D World*
www.InterTwined.co.uk

SOFTIMAGE|XSI

Ola Madsen is a 3D artist for Digital Context in Sweden, animating everything from medical treatments to teddy bears
www.digitalcontext.se

Quick Questions

No matter which 3D software package you use, our team of experts is here to help. Send us your query and we'll provide the solution: **http://forum.3dworldmag.com**

ON THE CD
Scene files and screenshots for all of the Q&As

● Although *Bryce* does not support true HDRI renders, realistic lighting effects can be achieved in the package using the simple workaround set out in this Q&A

BRYCE | Fake HDRI effects

How do you create HDRI-style reflections in *Bryce*?
THOMAS AKA TMGRAPHICS, VIA E-MAIL

Even though *Bryce* isn't a package that supports HDRI format files to create renders with real-world attributes, we can work around this by using generic image files and still end up with scenes that can produce quite realistic-looking reflections, refractions, and even lighting.

The concept is simple. Place a photographed image onto a sphere that's large enough to envelope your entire scene and camera. Any objects that are reflective or transparent/refractive within your scene will pick up on this surrounding photo, and appear more real-world realistic.

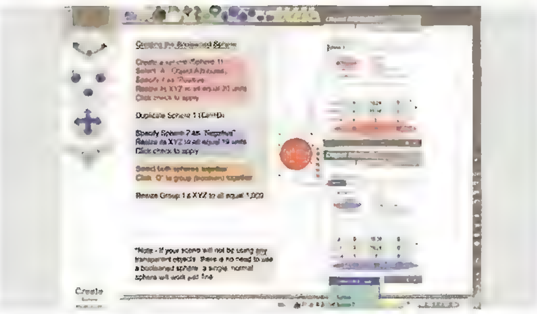
To start, create a default sphere, and make its attributes positive. Duplicate the sphere, make the duplicate's attributes negative and resize it to make it slightly smaller than the original. Then group the two spheres together. Using a Booleaned sphere will ensure that any glass objects in your scene don't have any ugly refractive artefacts. Now resize that Booleaned group to 1,000 units on all axes.

In the group's Material settings, apply an image as its texture. The best kinds of images to use are the typical HDRI images that can be found online (converted to BMP, JPG and so on); these images wrap seamlessly around a sphere.

Place markers in the A Channel beside Diffuse and Ambient. In the resulting Texture Source box, choose the P button to specify that you'll be using a 2D image as a texture. Click the Texture Source editor button directly above, to enter the Texture Source editor.

Above the Pict Image window, choose Load and browse to find the image you want to be used. Once loaded, copy and paste it into the Alpha Image box and, above that box, click the black/white button to invert it. Click the checkbox to apply and move back to the Material Library.

Set the mapping mode to Spherical, and the Material options to Normal. Your diffusion should be set to 100 and your Ambience to 15 - all others will be at zero. Additionally, in the A Channel, set markers beside Transparent and Transparency. Click the checkbox to apply, and then return to your scene. Now, when rendering, your objects (whether reflective or transparent) will look more realistic. **[KD]**

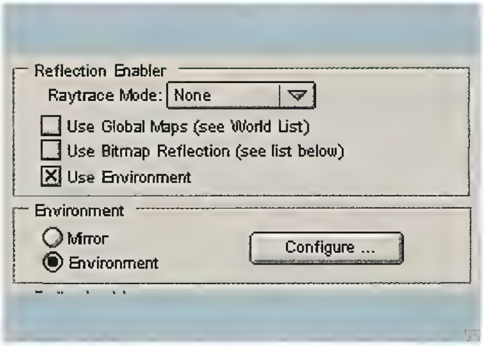


Using a Booleaned sphere will nullify any unwanted black or white refractive artefacts you may see in transparent objects when rendering

As this setup also works as a transparent light gel, any type of lighting may be used: from single-source lighting (the sun) to global light arrays

EIAS | I've read that raytracing is sometimes faster than Phong rendering. Really?

VIDEOFILM', VIA THE FORUMS



Reflection Enabler
Raytrace Mode: None
☐ Use Global Maps (see World List)
☐ Use Bitmap Reflection (see list below)
☒ Use Environment
Environment
○ Mirror
● Environment
Configure ...

01 **Creating realistic reflections**
Yes, really! EIAS has a great environmental reflection feature that will automatically generate an environment image for the selected model, then map that image as a very realistic reflection. This fake reflection is great with Phong, which doesn't support reflections. It's also often much faster than a raytraced solution - but not always.

02 **Render a single reflection in Phong**
In a test scene that has 49 spheres resting on a plane, we make just one sphere in the centre reflective using an Environmental map, and render it in Phong. Then we turn off the map, turn on raytracing, and render again. Phong rendering will win this race.

03 **Use raytracing for multiple reflections**
If we redo the test with all spheres being reflective, raytracing is much faster. This is because creating one or two Environmental maps is fine, but generating 49 is very inefficient. Why not just use a single map? Because this won't give you the inter-reflections between the spheres! How do you know which method is best for a scene? You have to test, and always at your final frame size; a raytracing will vary much more than a Phong with the size of the rendering. [LE]

CINEMA 4D | Coloured shadows

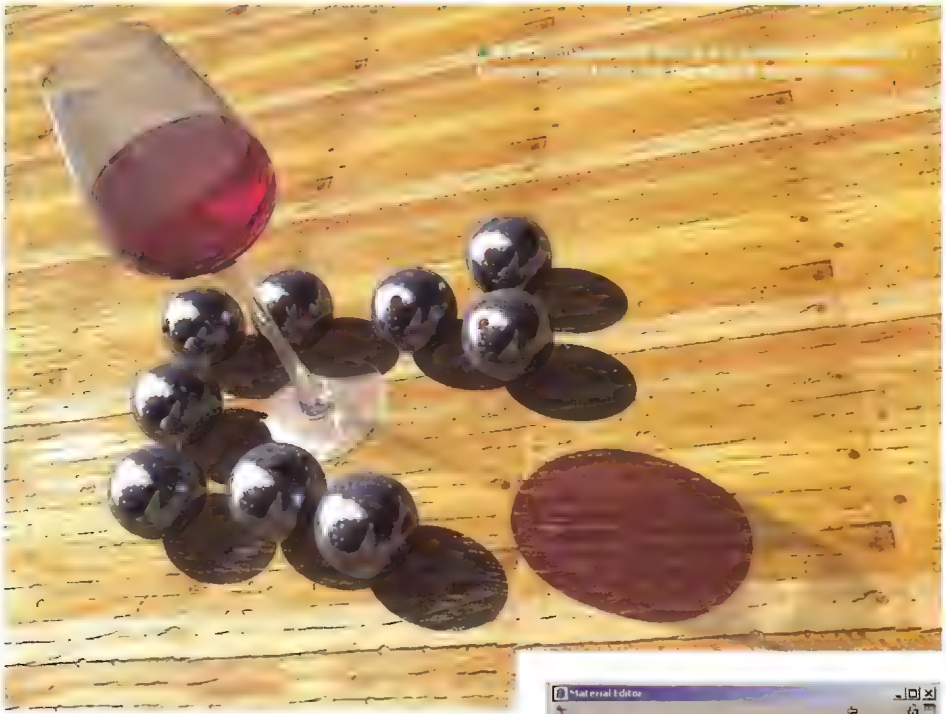
Q **I want the shadows being cast through my wine glass to take on the colour of the wine. I have the Color channel activated and defined, and the Transparency channel activated, but the shadows are still grey. Please help.** GAVINB, VIA THE FORUMS

A Shadows are a really interesting aspect of 3D. When asked: "What colour is a shadow?" most 3D students reply: "Black, of course." Yet, when you really look at a shadow, it doesn't turn the grass black, and concrete doesn't appear black under shadow - the colour of an object hit by a shadow simply becomes darker. Similarly, when light passes through a coloured surface, the liquid absorbs parts of the colour spectrum, throwing a coloured light out the other side. Although this is actually closer to caustics than shadows, *C4D*'s raytracer will calculate these 'coloured shadows' with or without its high-end caustic calculations.

To get this to function correctly, we must have the right channels activated. *C4D*'s raytracing renderer is quite sophisticated, but it will only do what it's been taught to do. In this case, the relevant information is that it uses the hues in the Transparency channel to decide which ones are weeded out of the colour spectrum as light passes through the surface - the values in the Color channel are irrelevant.

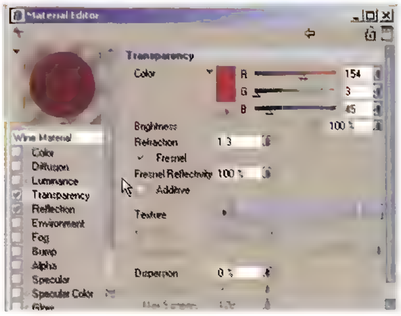
THE COLOUR OF AN OBJECT HIT BY A SHADOW IS DARKER

In the sample scene (on the CD), the wine texture actually has its Color channel deactivated; all colour is defined through the transparency. With a deep red for the Transparency channel, the surface illuminates to red as light passes through it, and it filters out all the colours of the spectrum except the red of the passing light. The net result is that the shadows the object casts have a hue to them. The red wine casts a deep red shadow, tinted blue glass creates blue shadows, and so on. You can still use caustics to add a bit of drama to the rendering, but you don't have to if you're short on time or rendering muscle. [AW]



Quick Tip

Separate objects
Make sure that in cases such as this where there's wine in a glass, you make two separate objects – [illegible] glass and one for the wine.



Wine Material
Color
Diffusion
Luminance
Transparency
Reflection
Environment
Fog
Bump
Alpha
Specular
Specular Color
Glow

Transparency
Color R 154 G 3 B 45
Brightness 100 %
Refraction 1.3
✓ Fresnel
Fresnel Reflectivity 100 %
Additive
Texture
Dispersion 0 %

The key to coloured shadows is a coloured Transparency channel to define what colours are filtered out as light passes through a surface

CARRARA 4 PRO | Simulating confocal microscopy with ShaderOps

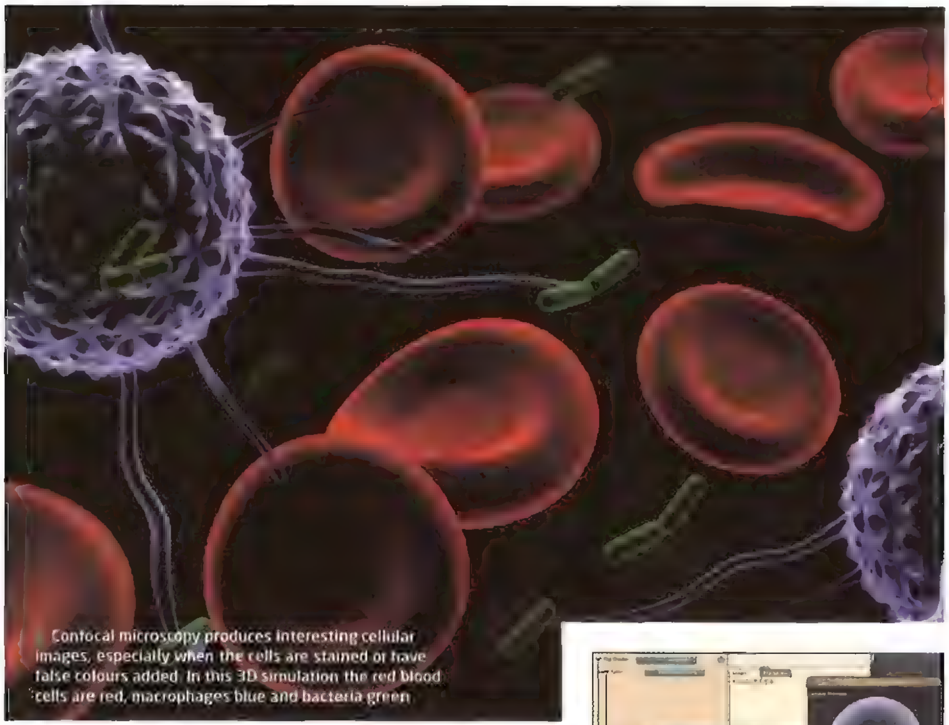
How do I create 3D cells that look as though they're photographed through a microscope?
STEPHEN COX, VIA THE FORUMS

Confocal microscopy is a photographic technique used to photograph tiny objects, such as cells, and has distinct characteristics, such as glowing edges, high contrast and shallow depth of field. Simulating confocal microscopy in *Carrara* will require a couple of shaders that use Invert and Fake Fresnel from the *ShaderOps* shaders (you can download a demo at **www.digitalcarversguild.com**). Create a new shader by selecting New Master shader from the Edit menu. In the Shaders tab of the Properties tray, double click on the new shader to jump into the Texture room. Begin creating the transparent confocal effect (such as the large blue cells) by adding an Invert function from to the Color channel. Next, add Fake Fresnel from *ShaderOps* to the Shader channel of the Invert function. The Rolloff value of the Fake Fresnel function controls the brightness.

Next, add Fake Fresnel to the Transparency channel. Here the Fake Fresnel Rolloff controls the amount or transparency. You may substitute a simple Value function in the Transparency channel instead. Finally, in the Glow channel, add a Multiply operator and, in Source 1, add an Invert function and another Fake Fresnel to the Shader channel. In Source 2, add a Color function. The Color function sets the surface colour of the object. Use the Rolloff value in this channel to control the amount of glow.

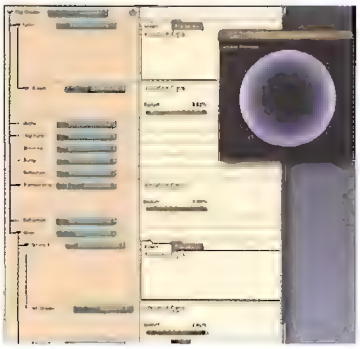
A variation on the transparent shader creates an opaque confocal effect, as in the stained red blood cells. This shader only has a Color function in the Color channel, set to a very dark colour. There's nothing in the Transparency channel of course, and the Glow channel stays the same as above. Co-ordinating the colour in the Color channel with the one in the Glow channel produces realistic effects. For instance, use a dark red in the Color channel and a light red in the Glow channel.

Enable the Depth of Field (DOF) property for the rendering camera, and adjust to simulate a shallow depth of field. DOF increases render time so, for a still image, it's more efficient to render objects separately (multiple renders), composite in *Photoshop* and simulate DOF using *Photoshop*'s Blur filters. **[MD]**


Confocal microscopy produces interesting cellular images, especially when the cells are stained or have false colours added. In this 3D simulation the red blood cells are red, macrophages blue and bacteria green

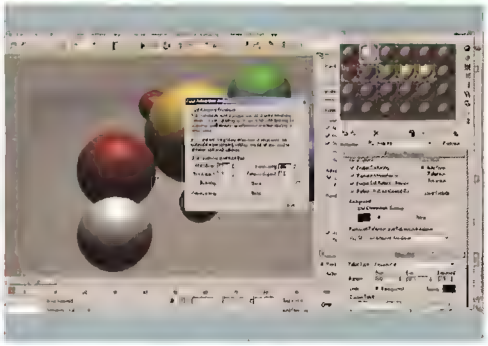
Quick Tip

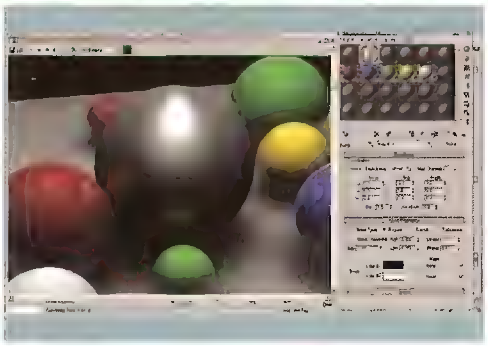
[illegible]


The trick to creating a convincing confocal effect is to place Fake Fresnel functions in the Color, Transparency and Glow channels of the shader tree

3DS MAX | How can I get an easy brushed/lathed metal effect in 3ds max?

DAVID GRASSMAN VIA EMAIL





01 Study the effect

To generate the effect correctly you must observe how it works in real life. Looking at the reference material (above, and included on this issue's CD), you'll notice that there are a few factors that combine to produce the effect: the texture of the material drives the way it reflects the environment and how its specularity behaves. We must therefore design our material accordingly.

02 Set the material properties

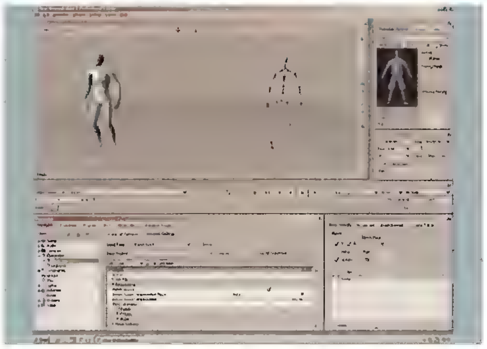
Open brushed_metal_start.max. In the Brushed Metal material, set the Diffuse Color to RGB 128, 128, 128; Specular Level to 170 and Anisotropy to 70. Add a raytrace map to the Reflection slot and set Attenuation Falloff Type to Exponential, with an End range of 50 and Exponent of 3. Enable the Fast Adaptive Antialiaser, and enter its settings floater by clicking '...'. Set Blur Offset and Defocussing to 0.5.

03 Apply the material to the sphere

To create the ringed texture seen in our reference material, add a Noise map to the material's Bump slot and set its Source to Explicit Map Channel so we can Spherical map the texture to an object (in this case, a sphere). Set U Tiling to 0, Noise Size to 0.001, High to 0.865 and Low to 0.255. Set the Bump amount to 10, apply the material to the sphere object in the middle of your scene and render. **[PD]**

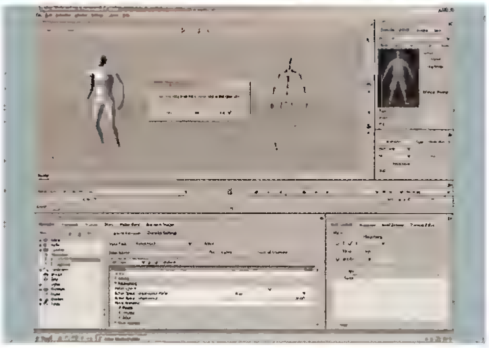
MOTIONBUILDER 6 PRO | How can I mix the best bits of two motion-capture clips?

ALLAN JOHNSON, VIA EMAIL



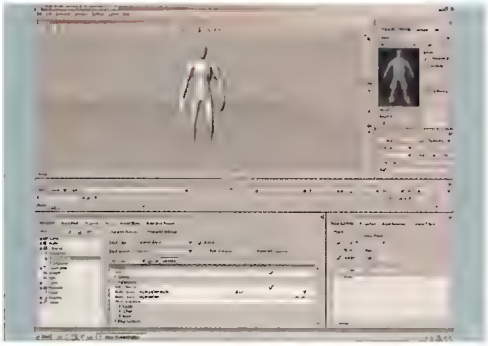
01 Open the CD file

One of the key benefits of *MotionBuilder* is its ability to manipulate motion-capture data and transfer it between one character and another. It's odd, then, that this area often causes confusion, especially when you want to transfer the motion data of specific body parts. To see the quick way to do this, open the file MB_Blend.fbx from the CD.



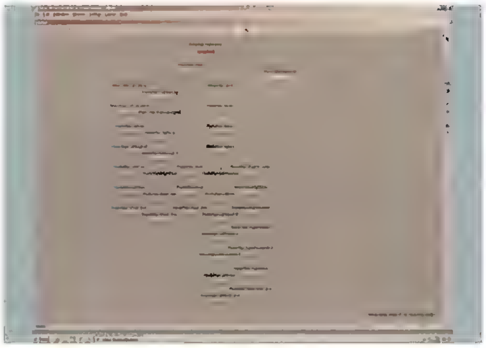
02 Replace the stepping motion

'Plasticman' has a pointing motion applied. As well as pointing, he also steps forward. We don't need him to do this, so take the standing motion from 'LegDonor', who's next to him. First you want to duplicate this whole Take, so create a new one by clicking on the Take drop-down on the Transport Controls bar, copying the data across when it asks.



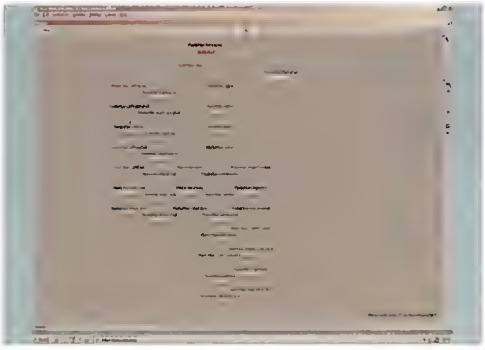
03 Change the Character Settings

In the Navigator window, select Characters > Plasticman and, under Character Settings, change his Input Type to Character Input and Input Source to LegDonor. Click the Active box to make Plasticman jump over and be controlled by the other skeleton. Click the Match Source button under the Retargeting options to see him move.



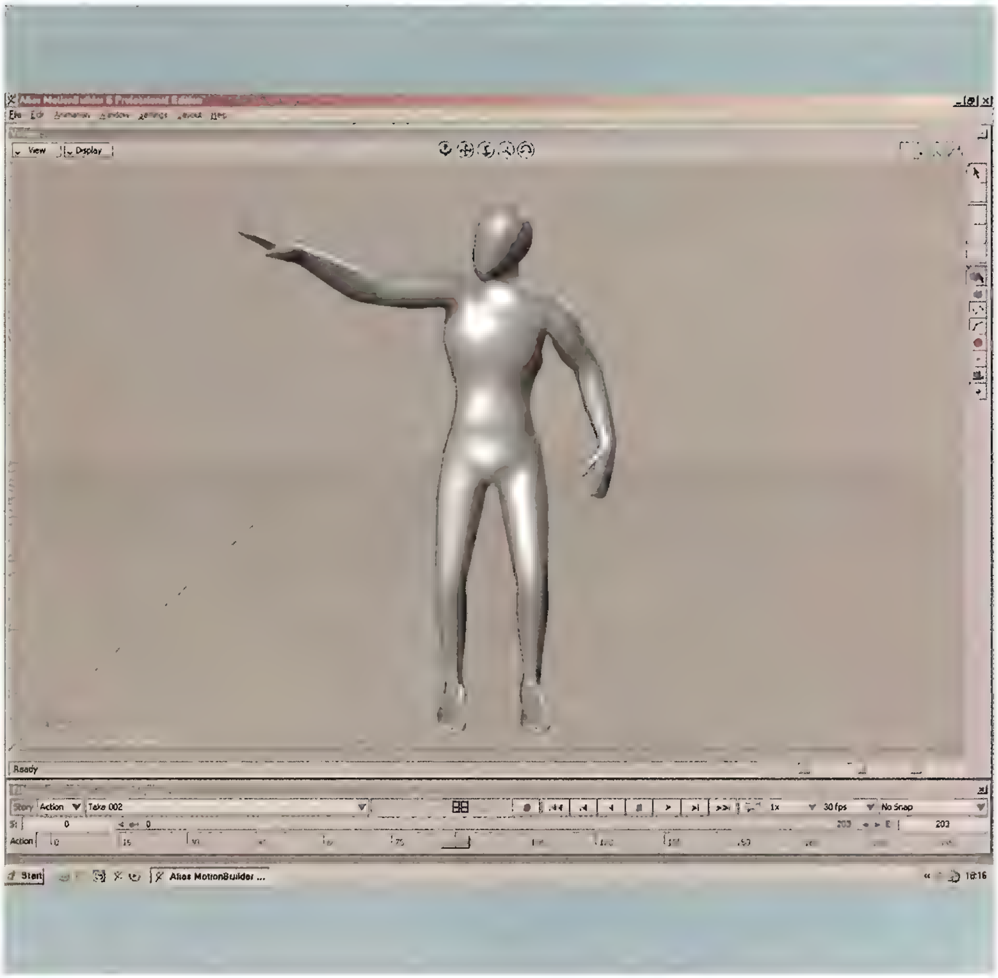
04 Combine the moves

Now hit the Plot Character button and select Skeleton to apply this new motion to Plasticman on this Take. If you now jump between Take 001 and Take 002, you'll see that Plasticman has both sets of moves; all we need to do now is mix them up. You can do this through the MotionBlend window. First Press [Ctrl]+[W] to bring up the Schematic view, and select Plasticman's skeleton from the first Spine Segment upward (including his arms and head).



05 Duplicate the track

Now [Alt]-drag this selection into the top bar of the MotionBlend window; it should apply a blue block to represent the animation. Duplicate the track to create a matching bar and, in the Take name to its left, change the name to Take 002. Change the main window back to a view of Plasticman to see what this has done – that looks nasty.

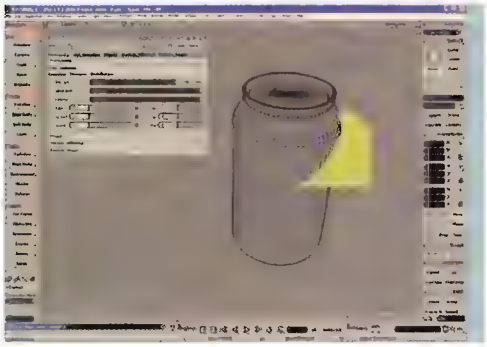


06 Merge the motions

Don't panic: this is where most people tend to get unstuck, but salvation is just a mouse click away. All you need to do is tick the Local Blending box, and Plasticman will be back in shape. The Local Blending option matches up the first Bone's location to the best of its ability – and its ability is pretty good. Scrub the timeline to see Plasticman stand in the same way that LegDonor did, but now with the initial pointing motion applied as well. All that we need to do now is to Process this motion down on to Take 002 to create a final version. So change the bottom Take box to read 002 instead of 003 and hit Process. Click Yes when you're asked if you want to overwrite the data and we're done. Happy Merging! [CO]

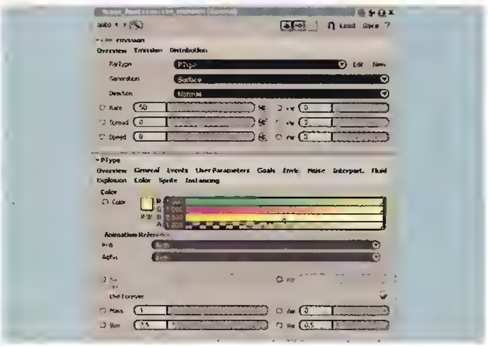
SOFTIMAGE|XSI | How can I get loads of water drops on the surface of a soda can?

LEE ROBERTSON, VIA EMAIL



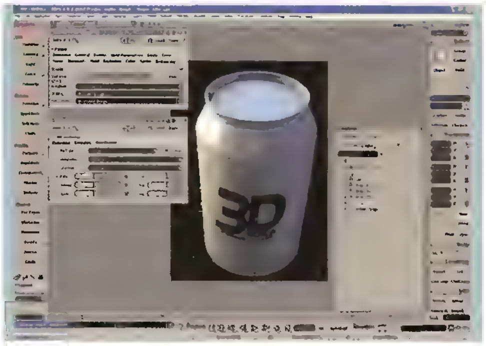
01 Edit the Particles properties

We tackled this topic in *LightWave* last issue. Now let's try it in *XSI*. Open the file 3dw_can.scn from the CD. By examining the scene, you'll see four objects: the can and three slightly altered water drops. Select the Can object, switch to the Simulate toolbar and click Simulate > Create > Particles > From Selection. In the ParticlesOp Property editor, scroll down to the can_emission > Overview tab and set the Speed to 0. This will make the particles generated stick to the surface of the can.



02 Set variable drop sizes

Next go to the Ptype > Overview tab and check the Live Forever box. Set the Size to about 0,5. Here we also have the option to add some variation to the drops. To make sure they don't appear too uniform or repetitive, change the Size Var. to about 0,5. Next, go to the Ptype > Instancing tab and check the Enable box. Open an Explorer by pressing [8], click the Pick button PType PPG and pick the water_drops group.



03 Select a frame

To get a better view of the size and distribution of your drops, change the OGL Display to Bounding Box. Now scrub the timeline until you find a frame in which you're happy with the amount and layout of water drops. If you want more drops, make sure your cloud is selected, click Inspect > Emission > can_emission and increase the Rate. Once satisfied, click Simulate > Modify > Particles > Set Initial State to make this your initial state. **[OM]**

FORM•Z RENDERZONE | Soft shadows through windows

Q **How do I create soft-looking shadows produced by light shining through windows? My lighting creates either ugly, hard shadows that shine correctly through the glass or soft shadows that don't shine through it at all. Please help!**

ELIZABETH BEASLEY, VIA EMAIL

A In *form•Z*, as in many other programs, lights can cast either hard (raytraced) shadows or soft (mapped) shadows. Both shadow types have pros and cons. Hard raytraced shadows shine correctly through transparent materials but only create hard shadow edges; soft mapped shadows create soft edges, but don't have the ability to shine through transparent materials. The secret, when rendering window glass (which is more or less totally transparent), is to use soft shadows, but to turn the Shadow Casting attribute of your window glass objects off.

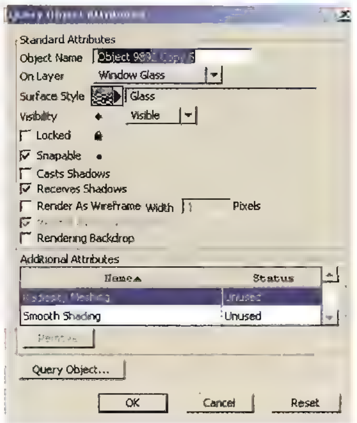
Double click on a light in the Lights palette. In the dialogue box that appears, set the Shadow type to soft (Mapped) and then click OK. Now you need to select all the objects that have been assigned your transparent glass material; ideally you should have organised these on a separate layer to make this process easier. Alternatively, you can use the Edit > Select By menu item and choose the glass material through the Attributes Tab > Surface Style item.

With all the desired objects chosen, select the Set Attributes tool. In its Options, activate the Shadow Casting checkbox, and choose No from the pop-up menu to the right. Click OK to return to the modelling window. Now click anywhere in the modelling window to execute the operation.

You can now render your scene – you should get soft shadows created by the wall and window frames. You won't get any shadows created by the window glass, because we've switched off the shadow casting for those objects. **[MH]**

BOTH THE HARD AND SOFT SHADOW TYPES HAVE PROS AND CONS

Soft shadows cast through transparent materials can be created by deselecting the Cast Shadows attributes



Standard Attributes

Object Name: Object 9891 Copy 6

On Layer: Window Glass

Surface Style: Glass

Visibility: Visible

☐ Locked

☑ Snapable

☐ Casts Shadows

☑ Receives Shadows

☐ Render As Wireframe Width 1 Pixels

☑ [illegible]

☐ Rendering Backdrop

Additional Attributes

Name	Status
[illegible] Meshing	Unused
Smooth Shading	Unused

The Query Object Attributes palette, in this case showing the Cast Shadows checkbox deselected

Quick Tip

Turn off Shadow Casting

[illegible]

LIGHTWAVE | Texturing with weight maps

Q **I'm trying to texture coloured gradients on some bamboo with weight maps, but every time I render I get a solid edge, not a feathered one.**

MATT – BYRONPETCH, FROM THE FORUMS

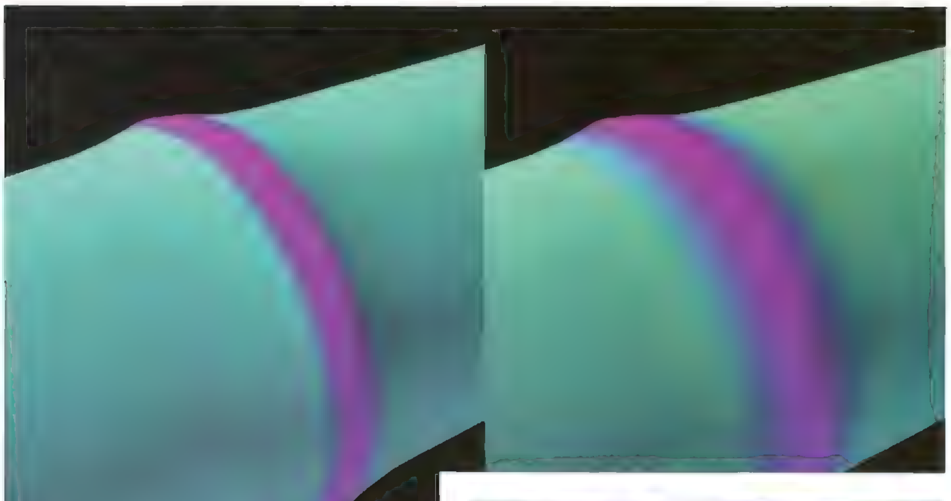
A What you're trying to do is pretty simple: use a Weight map to control the texturing on a bit of bamboo to save having to import images and set up texture maps, but it's not working because of the peculiar way *LightWave*'s Weight maps work. If you load bamboo.lwo (on the CD) into Modeller, you can fix the problem. Set the Perspective view to Weight Shade, and zoom into the middle of the three rings I've modelled. Select the single ring of raised polygons and, from the Weight Map pop-up on the bottom right, click New to add a new map called Ring, which will automatically have a value of 100%. The neat red-to-green gradient is what we want to reproduce in Layout.

Load the bamboo into Layout, and add a gradient colour texture to the surface. You'll need to add two keys, one in the middle at 0% and one at the bottom at 100% (the top is -100%, so it won't do anything), as in the screenshot. Give these wacky colours and render. You can see the problem: there's no nice falloff, just a solid ring of colour clinging to the selected polygons.

THE SOLUTION IS TO UNDERSTAND HOW WEIGHT MAPS WORK

The solution is to understand how *LightWave*'s Weight maps work. When you created the Weight map, you put a value of 100% on the points of the selected polygons. However, the rest of the points in the bamboo don't have a value of 0% – they have no value, because they aren't a member of the map.

In Modeller, select the points either side of the ring and, from the Map tab, go to Set Map Value. The Vertex map at the top should already be set to Ring – Weight, so set the Value to 0% and click OK. Now you've added the points to the Weight map, albeit with a value of 0%. Return to Layout, render and you'll see the smooth interpolation you were expecting. **[BS]**

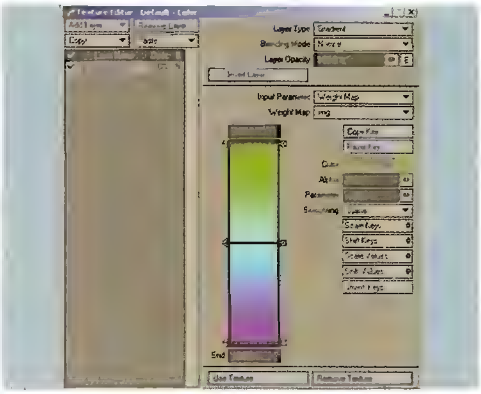


On the left we've got a nasty stripe of colour with no smooth gradient edges. On the right is the desired effect – a nice falloff

Quick Tip

Other maps

All *LightWave's* V maps: Weights Morphs, UV textures, Point Selections and Vertex Colours behave like this until they're added to the map they have no value, not even 0



Layer Type: Gradient

Input Parameter: Weight Map

Weight Map: ring

Set the gradient with values like these to test how it's working (see detailed explanation, left). Remember to set the input parameter to Weight Map and the Map to Ring

CONUNDRUM | Send us your solutions to this month's brainteaser

Each month, we set you, the readers, a real-world 3D problem to solve. The sender of the best solution will win selected training resources. Last issue's conundrum was submitted by *Maya* forum user fahiem, who wrote:

"I've created a virtual city and want to walk around it, looking directly out of the camera view. How can I make the camera react to the keyboard: i.e. to move forward, I press forward?"

The simplest solution was suggested by rintintin, who pointed out that View > Camera Tools > Fly Tool allows the user to navigate a scene as if it were a first-person perspective game. For those who want a more customisable result, myk proposed remapping the keyboard with the Hotkey Editor (Window > Preferences/Settings > Hotkey Editor). Click on the arrow with two bars above and below, select [Up] as the key to assign, then click on New (ringed on the screenshot on the right). To make this key move camera1 forward, enter this code in the window

```
move -r -os -wd 0 0 -1 camera1;
```

The same procedure can be used to make the [Down], [Left] and [Right] keys move the camera back, rotate left, and rotate right, respectively, using the following code.

```
move -r -os -wd 0 0 1 camera1;
rotate -r -os 0 5 0 ;
rotate -r -os 0 -5 0 ;
```

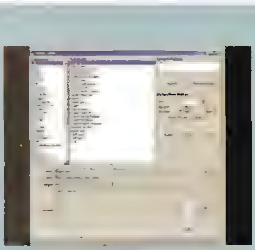
Myk also went one better, producing a simple MEL script for controlling the camera with the mouse, described by *3D World*'s resident *Maya* expert, Gary Noden, as "a corker, and one that reminded me of playing *Battlezone*." Regardless of Gary's taste in games, you can download the script at **www.myklittle.co.uk/mel/cameraControlScript.mel**. In the face of such hard work, there could be only one winner this issue, so congratulations to myk: the goodies are in the post.

[illegible]

Our conundrum for issue 64 is posed by Miriam Dobson, who contacted *3D World* to ask:

"How do I go about creating the rippled surface of a pond in *LightWave*? I'm trying to make use of ClothFX, but I'm having trouble working out the settings."

As usual, you can post your suggested solutions on the appropriate threads in the Mag Related or LightWave sections of our forum. Good luck – and have fun experimenting!



Use *Maya*'s Hotkey Editor to remap the arrow keys to control the camera. The vital buttons indicated in the text on the left are ringed in this screenshot

Training resources on offer!

Post your solutions to the conundrum on our forum, and the one we think is best will earn its author selected 3D training resources...

Forum | [illegible]

Contact us | You can also email your Q&A questions to 3dw.qanda@futurenet.co.uk

"Here I am, brain the size of a planet…" Marvin the Paranoid Android returns in the new *Hitchhiker's Guide to the Galaxy*. Full report next issue…

IN ISSUE #65

DON'T PANIC

Open your magazine, enter 'Hitchhiker's Guide to the Galaxy' on the keypad, and read all about Cinesite's CG

NEXT-GEN GAMES

As the new generation of games consoles appears on the horizon, we reveal what they'll mean for 3D artists

PHOTOREALISTIC SKIN

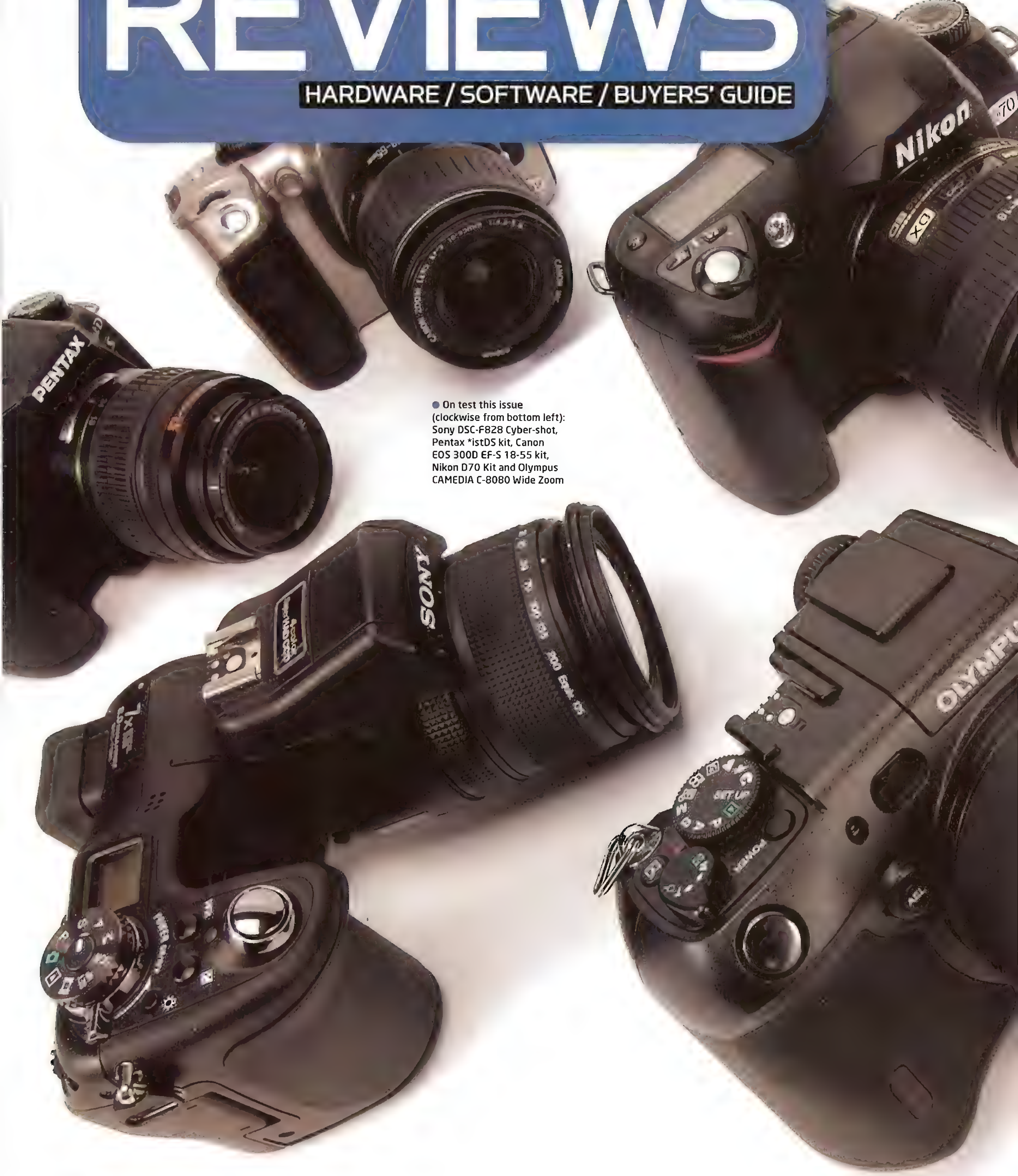
3D artist Leigh van der Byl presents an in-depth guide to texturing and shading perfect photorealistic skin

ON SALE TUESDAY 26 APRIL

Next issue, we reveal the implications of next-generation console tech for 3D artists working in games

REVIEWS

HARDWARE / SOFTWARE / BUYERS' GUIDE


Nikon
PENTAX
SONY
OLYMPUS

On test this issue (clockwise from bottom left): Sony DSC-F828 Cyber-shot, Pentax *istDS kit, Canon EOS 300D EF-S 18-55 kit, Nikon D70 Kit and Olympus CAMEDIA C-8080 Wide Zoom

Digital cameras

GROUP TEST Digital cameras are among a 3D artist's must-have tools. We looked at five mid-priced models to find the best flash for your cash...

BY MAT BROOMFIELD

There are many reasons when it's important for a 3D artist to own a digital camera. If you're building your own library of textures, you can avoid copyright issues, while producing original work of your own. You'll also enjoy much greater flexibility if you're able to photograph your own backgrounds, reflection maps and images for use as HDRI light sources.

A camera can be used to inspire, as well as to realise, your work. In the past, artists often used to carry a sketchbook, so that if they saw something that appealed to their artistic muse they could make a quick drawing. Nowadays, digital cameras enable you to perfectly capture any object or scene for incorporation into your own images.

There are many other uses for a digital camera – if you're an architect, you can use your digital photos for measuring the dimensions of a terrain or proposed development, and you can incorporate your finished designs into the photos. Better yet, you can even extract accurate 3D models directly from the two-dimensional photos. On a smaller scale, 3D modellers can do the same with maquettes, quickly converting preliminary scale models into textured 3D geometries that can be incorporated directly into your scenes, or edited into more useful meshes

There's a vast selection of cameras to choose from. Models beyond £1,000 tend to be aimed at professional users, and boast features such as ultra-high resolution, large-format images, unusual aspect ratios and interchangeable lens systems. At the other end of the spectrum, cheaper cameras tend to have small lenses, reduced manual control, and poor-quality imaging. With that in mind, we looked at models costing between £500 and £1,000; these produce images good enough for professional use, but are user-friendly enough for anyone to master

THE RIGHT IMAGE

We took five models from leading manufacturers, and evaluated them for ease of use and image quality. As well as taking portraits and landscape photos we captured shots in a range of situations; we took photos at indoor sports venues, and architectural shots at night. You can find examples of some of our test scenes on the CD.

The pros and cons of each camera will have different weightings according to your priorities, but image quality will surely be the most important consideration for most users, and this was the deciding factor in ranking our test models. All of these cameras are competent, but we preferred some more than others...

TALKING POINT | True colours

[illegible] performs post-processing on an image before saving it to the memory card. That's because the CCDs (charge-coupled devices) don't accurately capture and reproduce the colours of the real world, and this inadequacy needs to be compensated for. Some cameras, such as those from Nikon and Sony do it very well, while others don't.

Purists like having the option to download the unprocessed data in so-called RAW format, so that they can adjust it themselves; this way no image data is discarded by the camera's inbuilt processing system. Software such as *Photoshop* features support for many RAW formats, and provides manual and automated correction tools to ensure perfect colour reproduction.

▶

DETAILS

PRICE
£511 / $977* / €741*
*Currency conversion
(All prices exclude VAT)

PLATFORM
PC / Mac

MAIN FEATURES
- 8 megapixels
- 5x optical zoom

MANUFACTURER
Olympus

WEBSITE
www.olympus.co.uk

Olympus CAMEDIA C-8080 Wide Zoom

Compact and versatile, with a noteworthy heritage, the C-8080 wants to be your new best friend

Olympus has a long history in digital photography, and it's particularly good at producing mid-priced cameras such as this one. The CAMEDIA C-8080 is attractive to look at, with a magnesium alloy body, and the right side of the camera is ergonomically moulded so that it feels comfortable in the palm of your hand.

The left side feels a little awkward and cramped. It has a two-inch screen, which can be extended from the camera, and which tilts to enable you to view it while holding the camera at awkward angles. It's also bright enough to view easily in sunshine. The controls are well distributed around the camera body, and they're all clearly labelled, making it easy to find the right button fast. We particularly like the fact that the various preset shooting modes can be selected via the main mode dial. Some cameras (such as the Sony featured in this Group Test) force you to start selecting via the menus, but the C-8080's system is far more conducive to taking the right shot at the right time.

The camera captures at a maximum resolution of 3624x2448 pixels, providing 8 megapixels worth of data. It can store your images in JPG, TIFF or RAW formats for maximum editing flexibility.

With a zoom range of 5x optical and a 3x digital multiplier, the maximum zoom level is 15x. If there's one feature we dislike, it's the zoom controls. All the other cameras tested provide a manual zoom, and some offer both manual and electronic option, but the C-8080 only has an electronic control; it's too fast and jerky, with a horrible dial to control it. This means that, while everything else about the camera is optimised for speed, you can find yourself twiddling the dial in frustration as you try to frame your shot.

Overall the camera is very versatile and intuitive to use, making it ideal for photography novices.

VERDICT

PROS
- Versatile
- High resolution
- Inexpensive

CONS
- Not very ergonomic
- No manual zoom

RANGE OF FEATURES 8
VALUE FOR MONEY 9
OVERALL 8

DETAILS

PRICE
£723 / $1,387* /
€1,034*
*Currency conversion
(All prices exclude VAT)

PLATFORM
PC / Mac

MAIN FEATURES
- 6.3 megapixels
- 18-55mm lens
- Interchangeable lenses

MANUFACTURER
Canon

WEBSITE
www.canon.co.uk

Canon
EOS
300D
DIGITAL

Canon EOS 300D EF-S 18-55 kit

If image quality is your primary consideration, then the EOS is certainly worth checking out

When looking at other cameras with their 8-megapixel resolutions, you might look at the EOS and think: "Only 6.3 megapixels?" But wait a second – that still gives you a resolution of 3072x2048 pixels. That's 10x7 inches at a high 300dpi print resolution, so you can easily get A3 prints out of this camera.

The basic EOS 300D is nothing more than an SLR body, to which you can attach the lens of your choice. However, this kit also includes a Canon EFS 18-55 lens, which can't be purchased separately. The lens provides the 35mm equivalent of a 18-55mm focal length; while you don't usually talk about SLRs in terms of their zoom multiplier, this is about the equivalent of a 3.5x zoom.

The features that distinguish this camera from the competition are its wide light sensitivity range – equivalent to an ISO film rating of 100-1600 – and its massive shutter speed range, from 1/4000th of a second up to 30 seconds. It also has a wide range of white balance options, as well as manual and auto modes. All this means that the camera should be equally capable of shooting action shots and long-exposure night scenes, although in mixed lighting conditions we found that its light metering tended to produce overly dark, underexposed images. On the subject of action shots, the EOS 300D can capture up to four frames in burst mode, at a rate of 2.5 frames per second.

The camera body is quite bulky, and is only made of plastic, so it won't stand up to much abuse. Furthermore, our review model's viewfinder was covered in dust on the *inside*, which is both infuriating and hard to clean. However, the controls and menus are easy to use, if not as intuitive as those on the Olympus, and overall this is a competent SLR camera with a few minor, but frustrating, limitations.

VERDICT

PROS
- Interchangeable lenses
- Good sequence shooting
- Fast shutter speed

CONS
- Limited focal range
- Relatively expensive

RANGE OF FEATURES 7
VALUE FOR MONEY 5
OVERALL 7

DETAILS

PRICE
£899 / $1,725* /
€1,307*
*Currency conversion
(All prices exclude VAT)

PLATFORM
PC / Mac

MAIN FEATURES
- 6.1 megapixels
- 18-55mm Nikkor lens

MANUFACTURER
Nikon

WEBSITE
www.nikon.co.uk

Nikon D70 Kit

The key to taking great pictures is having a great lens, and this camera has a very good lens indeed

Like the other two SLRs featured in this Group Test the D70 is available both in kit form, with a lens, and as a body on its own. We opted for the kit version because we were looking for ready-to-go solutions, rather than components.

The kit comprises the D70 body and a terrific Nikkor 18-70mm lens. This is probably the best lens in our test, with super-sharp optics that respond well to subtle colour and lighting conditions.

The camera itself feels unnecessarily bulky and heavy, and this is not a model you'd want to heft around for very long. On the plus side, however, of the models we tested this one most felt like a 'proper' camera should feel, it's substantial, and sits comfortably in one hand, allowing your other hand to rest naturally on the focus and zoom rings. This is a camera for someone who knows what they're doing, and exactly how they want to do it.

With 6.1 megapixels of effective CCD sensor, the D70 provides a maximum resolution of 3008x2000 pixels, and enables you to save pictures in JPG or RAW formats. From a professional perspective, the camera provides you with all the manual control you could want, yet it still offers fully automated operation for less experienced users.

An incredibly fast shutter speed of 1/8000th of a second enables you to capture the liveliest of action shots, while the D70's burst mode, which can capture four sequential frames in RAW format, is the fastest in the group, making the camera ideal for sports or nature photography.

The controls are very accessible, with virtually all of them on the back of the body rather than hiding around the sides, and the zoom and focus rings feel exactly as you would wish them to. The D70 is the perfect camera for capturing those opportunist, one chance only photos.

VERDICT

PROS
- Excellent image quality
- Interchangeable lenses
- Ergonomic design

CONS
- Relatively expensive
- Limited range of focal lengths

RANGE OF FEATURES	7
VALUE FOR MONEY	8
OVERALL	8

DETAILS

PRICE
£680 / $1,305* /
€973*
*Currency conversion
(All prices exclude VAT)

PLATFORM
PC / Mac

MAIN FEATURES
- 6.1 megapixels
- 18-55mm lens
- 30s-1/4000th second shutter speed
- Compatible with all previous Pentax lenses

MANUFACTURER
Pentax

WEBSITE
www.pentax.co.uk

Pentax *istDS kit

It looks great, it's compatible with all previous Pentax lenses and it handles well - so what's the catch?

When we put together a Group Test we start from the feature table, use the individual products for a while, then finish with benchmarking – in this case by comparing photos. In the course of this process the Pentax began in last place, moved up to first and then dropped back to last again.

On paper the *istDS isn't very inspiring, although it's certainly competent. As we discovered to our detriment, one of its great flaws is that it only accepts SD memory cards and, like the other two SLRs, the kit doesn't include any memory at all. If it's only going to be compatible with a single type of memory, it should be something ubiquitous, like Compact Flash.

The fact that the camera can accept all previous Pentax lenses, including those for film cameras, seems like a huge bonus if you already own a Pentax, but the fact that power zoom functions aren't supported is a big disappointment.

At first glance, the camera itself appears over simplistic, but it's actually a masterpiece of minimalist ergonomic design. Everything you need can be controlled using just a few buttons and dials, so you won't find yourself struggling to find something at a vital moment. We successfully used the camera in a variety of challenging situations: on a windy hill, in freezing temperatures and in the dark.

However, the one thing that slapped this camera all the way back from first to last was image quality. We could tolerate 6-megapixel resolution if the clarity was excellent but, not only did the images lack the crispness of their rivals (check out the chimneys in the refinery pics on our CD), but the colours were really over-saturated, making even the most mundane scene look garish.

The *istDS handles as well as you could hope for but, ultimately, its image quality, and its reliance upon SD memory, are major strikes against it.

VERDICT

PROS
- Ergonomic
- Intuitive
- Uses interchangeable lenses

CONS
- Poor image quality
- Limited memory card support

RANGE OF FEATURES	7
VALUE FOR MONEY	6
OVERALL	6

▶

THIS MONTH'S WINNER

Sony DSC-F828 Cyber-shot

The company may be better known for its stereos and TVs but you'll never go far wrong buying a Sony, and this versatile camera is a great choice for serious users

DETAILS

PRICE
- £566 / $1,087* / €823*

*Currency conversion
(All prices exclude VAT)

PLATFORM
PC / Mac

MINIMUM SYSTEM
- Any Mac or PC with a USB port

MAIN FEATURES
- 8 megapixels
- 7x optical zoom
- Rotatable lens system for awkward angles
- Video recording
- Uses memory sticks and Compact Flash, including microdrives
- Manual focus/zoom options

MANUFACTURER
Sony

WEBSITE
www.sony.co.uk

Sony may not have the photography heritage of its rivals in this test, but what it lacks in ancestry it more than compensates for in flair, ergonomics and versatility.

Like the CAMEDIA, the Cyber-shot enables you to alter the angle of the view-screen relative to the body, so that you can take awkward high- or low-level shots with confidence. However, whereas the Olympus model has a small fold-out screen, the Sony pivots the lens independently from the body. It's a less elegant solution, but it's more than the other three cameras on test offer

The F828 has a fixed Carl Zeiss lens with a massive 7x optical zoom. This makes the camera rather front-heavy, and it's not very ergonomic for single-handed use. What impressed us most was the quality of the zoom, which at this level of magnification, we expected to be awful However, if you check out the images on the CD, you'll see that the test images of an oil refinery, taken from seven miles away, were substantially enhanced with minimal loss of quality.

The Cyber-shot also boasts a truly innovative focus system. When you switch to manual focus the image is magnified so you can see the effect of your changes more clearly. It's interesting, but nowhere near as effective as a viewfinder hologram, and it falls flat in night shooting situations.

The F828 tries so hard to be versatile that we thought it might fail to deliver in some areas, but it doesn't. It records video clips, and provides three image formats, sequence shooting and a variety of shooting modes. However, you must go into the menus to change scene modes, which slows things down; the other cameras provide this option on the mode dial for instant selection. The modes are at least in context-sensitive menus, and we found that the Sony's metering, combined with selection of the appropriate mode, produced the most faithful colours in our test, along with the Nikon.

IMAGES TAKEN FROM SEVEN MILES AWAY WERE ENHANCED WITH MINIMAL LOSS OF QUALITY

The F828 has the most intuitive menu system of the cameras on test, but many of the options are on buttons situated way around the side of the camera Fortunately, these don't generally control options that you might need to select in a hurry

The camera offers 8-megapixel image capture, and we'd expected the image clarity to suffer in what's become something of a numerical arms race. However, we were pleasantly surprised to see that the camera used the extra resolution to enhance the image quality, rather than simply enlarging the file size

With its high resolution, massive zoom and ease of use, this is a great camera for users who place balanced performance ahead of an interchangeable lens system or SLR convenience.

VERDICT

PROS
- Industry-leading zoom
- High image resolution
- Excellent image quality

CONS
- Doesn't accept different lenses
- Menu-based scene selection

RANGE OF FEATURES	8
VALUE FOR MONEY	9
OVERALL	9

THE AVERAGE USER DOESN'T WANT TO HAVE TO BECOME A PHOTO TECHNICIAN IN ORDER TO TAKE A FEW NICE PICTURES

CONCLUSION | Choosing your perfect digital camera

We've looked at five promising mid-priced cameras and, despite our preconceptions, we were surprised by the best all-round performer. The three SLR models from Canon, Pentax and Nikon all offered a lower resolution than the all-in-ones, and we attributed this to the fact that the manufacturers had opted for image quality rather than resolution. However, our results showed this not to be the case, with both the Canon and Pentax models producing disappointing photos.

The advantage of SLR is the fact that what you see through the viewfinder is what the camera records. However, with LCD screen previews, this seems less important than it was for film cameras, which of course lacked such a live preview mode

The ability to attach additional lenses is important for 'serious' photographers, or those who know their way around a camera. However, when you consider the zoom range of the Sony, which goes from a 2cm macro close-up right up to a 7x (200mm equivalent) telephoto, you begin to appreciate that all-in-ones can be extremely versatile, and save you a lot of money to boot

Of course, you don't get the absolute, optimal lens quality from a single lens that you might from a set of three or four interchangeable lenses and, if that single lens is damaged, then the entire camera is ruined. More importantly, if you want to do something special, using a super-telephoto or fisheye lens for example, the Sony or Olympus models are no use to you. However, during this group test we worked on the assumption that our readers are graphics users, rather than photography professionals Thus, ease of use, affordability and out-of-the-box performance probably rate more highly than the facility to expand your camera kit at a future date.

ALL THE RIGHT BUTTONS

Ergonomics were of critical importance to us. Although this relates to the physical shape of the camera, of far greater importance to us was the location and operation of the buttons, and the ease with which menus could be navigated. Nothing is more irritating than missing a one chance photo opportunity because you had to figure out how to set your camera up, and then spend 30 seconds getting there, so intuitiveness and accessibility were high on our list.

Of equal importance was image quality. It doesn't matter how high your resolution is, or what clever metering, focusing or bracketing technology you employ, if the end result is not a decent photograph Including performance in adverse lighting conditions as a criteria on which the cameras were judged was always going to make this a challenging group test – mixed lighting, night shooting, fast shutter requirements, and the need to overcome colour castes are challenges that any camera can expect to face, and we considered the range of automatic and manual technologies available to overcome these difficulties However, the average user doesn't want to have to become a photographic technician in order to take a few nice photos, so the effectiveness of automatic compensation features was factored into the overall conclusion.

Bearing all these factors in mind, the contest came down to a choice between the professional Nikon kit and the incredibly versatile and capable Sony Cyber-shot Interchangeable lenses apart, in our opinion the Sony offers all the image quality and versatility that the average user could want, and (minor niggles aside) we have no problem recommending it ●

VITAL STATISTICS

MODEL	[illegible]	OPTICAL/DIGITAL ZOOM/35MM EQUIV	[illegible]	[illegible]	BURST MODE	APERTURE	INCLUDED/ TYPE	FILE FORMATS	[illegible]	[illegible]	[illegible]	[illegible]
Olympus CAMEDIA C-8080	3264x2448/8 megapixels	5x/15x/28-140mm	2cm	16s – 1/4000s	[illegible] images @ 1.6fps (JPG) or 25 @ [illegible]	F3.5	[illegible] card, Compact Flash	JPG, RAW, TIFF	Y/Y	Y/N	£511	**8**
Canon EOS 300D	3072x2048/6.3 megapixels	N/A/N/A/18-55mm	N/A	30s – 1/4000s	4 images @ 2.5fps	F3.5-5.6	0MB/Compact Flash	JPG, RAW	Y/Y	N/Y	£723	**7**
Nikon D70	3008x2000/6.1 megapixels	N/A/N/A/27-105mm	N/A	30s - 1/8000s	12 images (JPG) or 4 images (RAW) [illegible]	F3.5-4.5	0MB/Compact Flash	JPG, RAW	Y/Y	N/Y	£899	**8**
Pentax *istDS	3008x2008/6.1 megapixels	N/A/N/A/18-55mm	N/A	30s – 1/4000s	8 images @ 2.8fps	F3.5-5.6	0MB/SD memory	JPG, RAW	Y/Y	Y/Y	£580	**6**
Sony DSC-F828	3264x2448/8 megapixels	7x/35x/28-200mm	2cm	30s – 1/3200s	7 images @ 0.38s interval	F2.0-2.8	Compact Flash	JPG, RAW, TIFF, MPEG1	Y/Y	Y/Y	£566	**9**

Maya 6.5

It might have faster modelling, better tools and slicker rendering, but is the newest version of Maya really worth such a hefty price tag?

BY GARY NODEN

DETAILS

PRICE
- *Maya 6.5 Complete* £1,449 / $1,999 / €1,520*
- *Maya 6.5 Unlimited* £4,899 / $6,999 / €5,322*
- *Complete* Upgrade from £659 / $899 / €684*
- *Unlimited* Upgrade from £909 / $1249 / €950*

*Currency conversion

PLATFORM
PC / Mac / Linux

MINIMUM SYSTEM
PC
- Win XP Pro / 2000 Pro
- Pentium III or AMD Athlon processor
- 512MB RAM

Mac
- OS X 10.3
- Power Mac G4 and G5
- 512MB RAM

Linux
- Red Hat Linux 9.0 / Red Hat Enterprise Linux 3.0 WS / SUSE Linux 9.1
- 512MB RAM

MAIN FEATURES
- Improved polygon modelling tools
- Animation tools sped up
- Proxies added to Reference Editor
- Improved character tools
- *mental ray* satellite rendering
- Improved Final Gathering, GI and Caustics
- Addition of Sub Surface Scattering Shaders to *mental ray*
- Rapid Scanline Renderer fur and motion blur

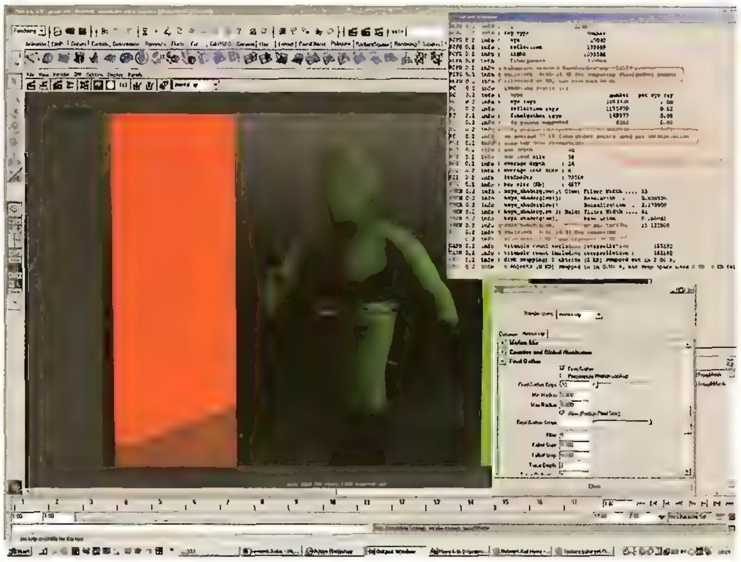
DEVELOPER
Alias

WEBSITE
www.alias.com

RELATED PRODUCTS
- *Maya 6*

Reviewed: Issue 52

M*aya* has come on leaps and bounds since I first sat down in front of (what I then thought of as) a hotchpotch of two rival firms' software packages. Yes, it cost a fortune, but all software cost a fortune back then; it was expected and, as long as you paid a maintenance contract, you received free upgrades. Having never paid maintenance personally - it starts at over £1,000 a year per seat - I've never had to really think about upgrade charges. But it would appear that the release of *Maya 6.5* has made many Alias supporters protest loudly about whether the upgrade charge of £659 ($899) for *Complete* alone is really worth it.



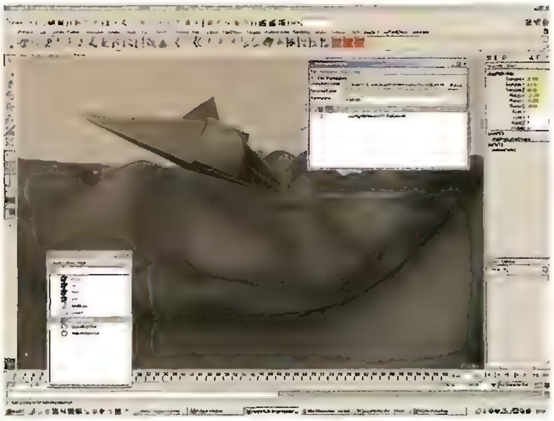
Meet Ray Gathering. He's here to show you how green with envy the competition will be at the speed of *Maya 6.5* renders. This 1024x768 image took 1 minute 24 seconds to generate

The first thing (according to Alias) is that this version is faster. It claims that, in some cases, the software is ten times faster. Now a claim like that had better have some truth behind it. It does: modelling tools are faster and somewhat more refined, some animation tools are staggeringly quicker and even some of the pain of rendering is suppressed.

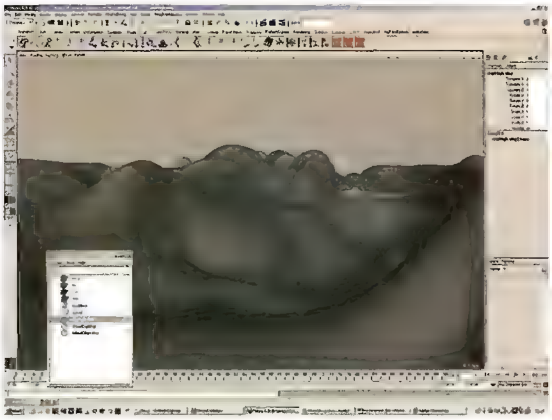
THE NEED FOR SPEED

In terms of modelling updates, the Bevel tool is probably the best example. Despite the fact that it's been available in other packages for years, it now creates polygons, or N-Gons, in the corners of your bevels, and allows editing of the smoothing groups within the tool, too. Helpfully, this smoothing function has also been built into the Extrude tools. Slower tools, such as the Polygon-mirroring tool, are slightly faster than before, as are the Polygon UV Editing tools, but these speed increases aren't very noticeable until you put them all together. Apart from a heads-up display for subdivision surfaces, not a lot else has changed outside the polygon toolset. I got the feeling that this version has been redeveloped specifically for the gaming market, which would be logical, since Softimage is currently making a big point of *XSI* having been used for *Half-Life 2*, so Alias won't want to be left behind.

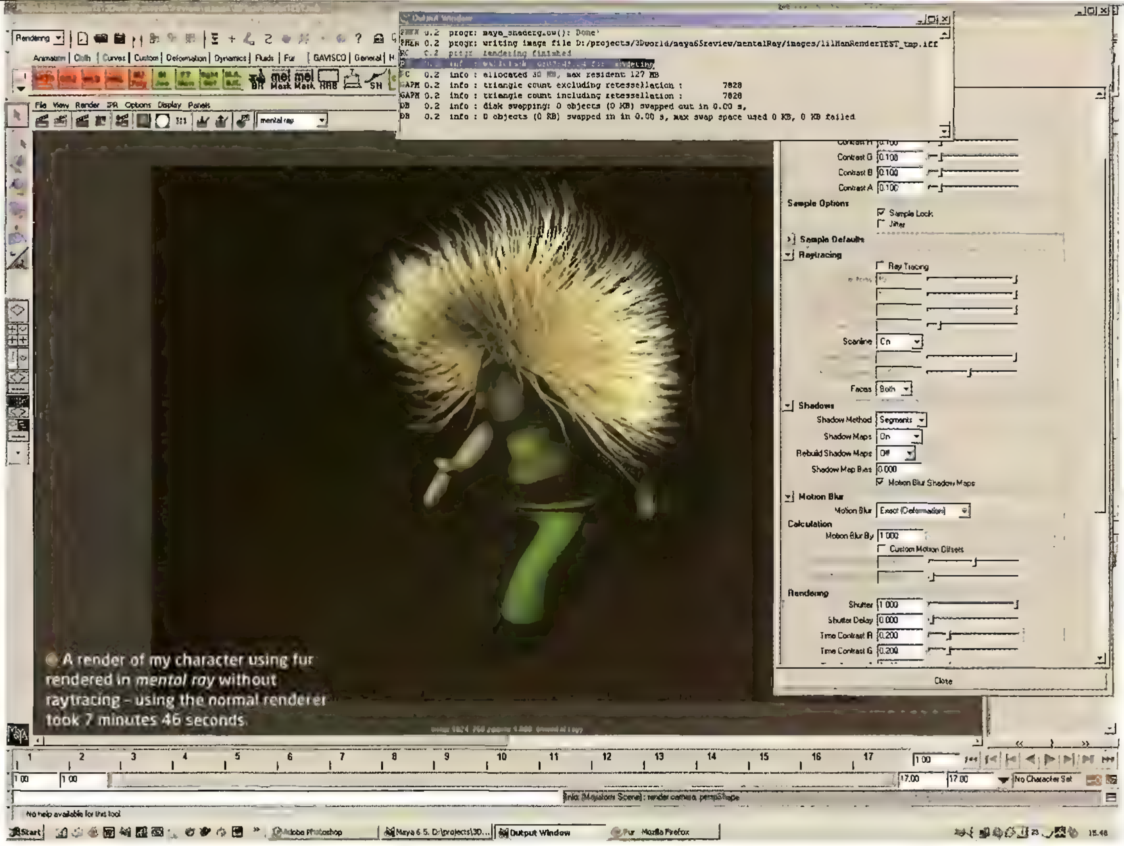
But when it comes to the animation tools, you can see real change. Creating a Wrap deformer on a NURBS Cylinder with 30x30 isoparms in *Maya 6.0.1*, its wireframe playback was 2.6fps on an Nvidia Quadro4 980 XGL. The same scene loaded up into *Maya 6.5* ran at an incredible 20fps. "Now you're talking," I thought. It's as if somebody has gone through the code and shed all the stuff that makes *Maya* run like a lame horse. This is evident throughout the



Ah, the lovely proxy. Notice the rather attractive motion of the lo-res spaceship following an animation curve...



...and when I toggle back to the hi-res version, notice its lack of anything beyond sitting at the origin. Such a simple requirement



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PHEN 0.2  progr: maya_shaderg.ow(): Done'
PHEN 0.2  progr: writing image file D:/projects/3Dworld/maya65review/mentalRay/images/lilManRenderTEST_tmp.iff
RC   0.2  progr: rendering finished
RC   0.2  info : allocated 30 MB, max resident 127 MB
GAPM 0.2  info : triangle count excluding retessellation :        7828
GAPM 0.2  info : triangle count including retessellation :        7828
DB   0.2  info : disk swapping: 0 objects (0 KB) swapped out in 0.00 s,
DB   0.2  info : 0 objects (0 KB) swapped in in 0.00 s, max swap space used 0 KB, 0 KB failed
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Contrast G 0.100
Contrast B 0.100
Contrast A 0.100
Sample Options
☑ Sample Lock
☐ Jitter
Sample Defaults
Raytracing
☐ Ray Tracing
Scanline On
Faces Both
Shadows
Shadow Method Segments
Shadow Maps On
Rebuild Shadow Maps Off
Shadow Map Bias 0.000
☑ Motion Blur Shadow Maps
Motion Blur
Motion Blur Exact (Deformation)
Calculation
Motion Blur By 1.000
☐ Custom Motion Offsets
Rendering
Shutter 1.000
Shutter Delay 0.000
Time Contrast R 0.200
Time Contrast G 0.200

Close
Rendering
Animation | Cloth | Curves | Custom | Deformation | Dynamics | Fluids | Fur | GAVISCO | General
File View Render IPR Options Display Panels
mental ray
No Character Set
No help available for this tool
Start
Adobe Photoshop
Maya 6.5: D:\projects\3D...
Output Window
Fur - Mozilla Firefox
15:46

A render of my character using fur rendered in *mental ray* without raytracing – using the normal renderer took 7 minutes 46 seconds

animation toolset. Influence deformers can now be applied to a character at any point without having to revert back to a bind position; joint radii are now dictated by the length of a bone, making for visibly more manageable skeletons; and you can now bind skin to non-joint objects. You can even blend constraints with hand animation.

Alias is really keen on its proxies too. This is meant to allow you to replace data-heavy models with lower-resolution versions to speed up your animation process. It's a great idea, but implementation leaves a lot to be desired. Unless both hi-res and proxy have a character node created with the same name, you can't animate one and expect the other to have the animation, which seems a little daft.

IT'S AS IF SOMEBODY HAS SHED ALL THE STUFF THAT MAKES MAYA RUN LIKE A LAME HORSE

RAY OF LIGHT

On the plus side, Alias has made several integration improvements to *mental ray* such as faster, more informative Final Gathering with the new ability to do multiple light bounces, and the satellite render server, which allows for improved multiple processing. In fact, there are many improvements to the renderer, Rapid Scanline Rendering being one of the major ones. One of its virtues is that it renders non-raytraced motion-blurred fur faster than the original rendering solution, which is fair enough. But the reason why we render fur in *mental ray* is because we want beautiful, raytraced shadows of our fur – something we can't do with the *Maya* renderer. However, a Shadow map render in *mental ray* takes about three minutes for a 1024x768 frame; the *Maya* software renderer took only 23 seconds to render the same image. It might not be quite as good but, sometimes, speed wins out.

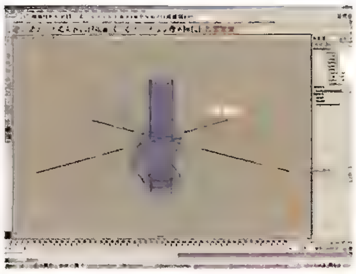
And then there's Subsurface Scattering. We know how great it is, but its lack of documentation lets this down. But then, we're used to poor documentation with the software, anyway.

So, ultimately, is *Maya 6.5* worth the money? Well, the modelling is a bit quicker, the animation tools are loads faster and the rendering is slicker with *mental ray*. But we still don't have any good *mental ray* documentation, and the proxies haven't improved the Reference editor much. Also, the possibility of getting what had been *MotionBuilder* into *Maya* has been shot down by Michel Besner, Alias' Vice President of Business Development – Emerging Technology: "*MotionBuilder* will remain an independent product," he said.

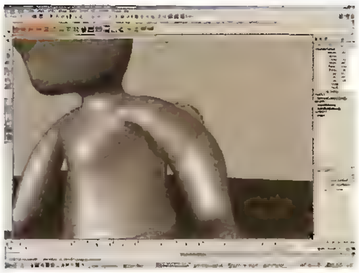
HALF FULL

Overall, *Maya 6.5* is a fairly good upgrade but by no means a perfect one. Calling it a point-five release is accurate: it feels like half an improvement. If you're an independent user, or running a small studio for which upgrade costs are not a trivial part of the annual software budget, you might want to think carefully before you buy – or even wait a while until *Maya 7* is released.

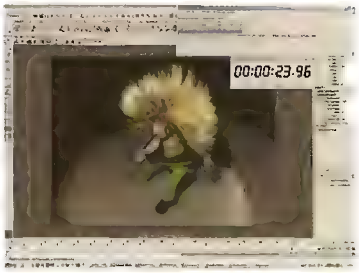
But despite my scepticism, *Maya 6.5* could be a set up for something greater. Speculative rumours have recently surfaced that the improved data handling has been set up for *Maya's* 'Next Big Thing'. Cue me holding my breath... ●



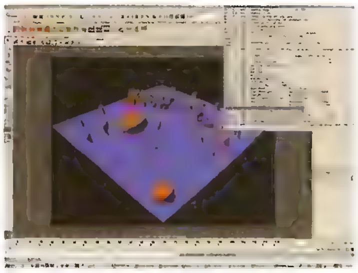
This is the Wrap deformer in *Maya 6.5*: notice the whopping great render speed of 20 fps – very impressive, I'm sure you'd agree...



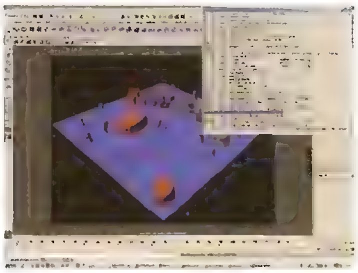
This Wrap deformer was applied in the middle of my character's walk cycle – something you couldn't do before



The same scene, using *Maya's* render engine and larger Depth map shadows. It took only 24 seconds to render. I know which one I prefer...



The improved displacement claims seem a little hard to understand. I rendered this scene in *Maya 6.0.1* and it took almost 18 seconds



The same scene loaded up into 6.5 had a speed change in the wrong direction: it took almost 20 secs, with no difference in quality

VERDICT

PROS
- Improved polygon modelling
- Faster animation tools
- Faster Final Gathering

CONS
- No proper docs for *mental ray*
- Proxies need more work

RANGE OF FEATURES	8
VALUE FOR MONEY	6
OVERALL	7

boujou 3

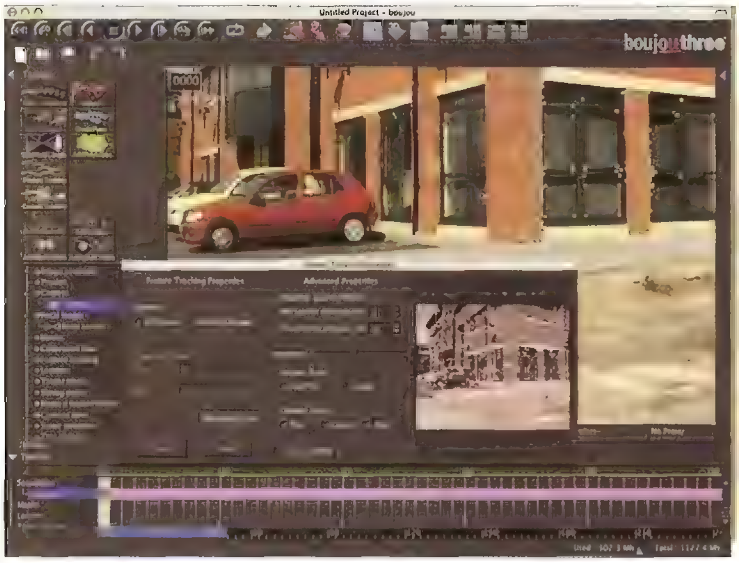
Once a pioneer in the world of matchmoving, is 2d3 guilty of resting on its laurels with this new version of its signature software?

BY MARTIN SOUTHWOOD

With 3D CGI increasingly being combined with live footage by film and video makers, the problem of making a CG object blend in with its surroundings is a problem faced by busy post-production houses almost every day. Until surprisingly recently this process involved the extensive use of a tape measure during shooting, scrupulous note-taking and weeks of making painstaking naked-eye judgements on a frame-by-frame basis.

Although some of these techniques can still provide extra information about a shoot, the wonder of geometric algorithms helped to give birth to a new genre of technology called film tracking, or matchmoving. And, despite being only a few years old, this technology's growing up fast.

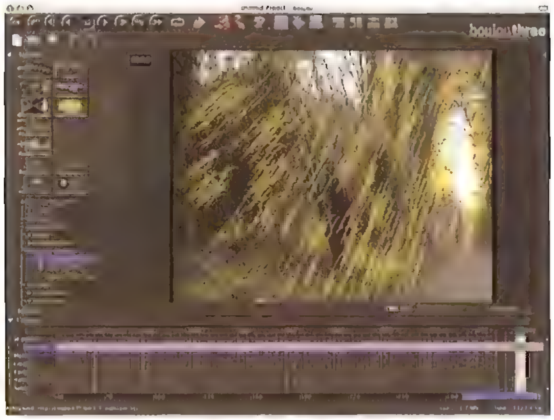
If you're not already familiar with matchmoving, its sheer usefulness means you probably will be very soon. Basically, what tracking software does is create a virtual camera, and calculate its movement within a scene. It starts by picking out points from a 2D source (your footage), which it can track beyond a given number of frames. Then (working on the principle that from the tracked points to the camera position is a straight line), it traces the movement of these points, and their movement in relation to each other, and uses this information to match the position of the CG camera to that of the camera that shot the live footage. Once this is done, distances, depth and perspective can be recreated in a 3D environment, and you can put your tape measure away.



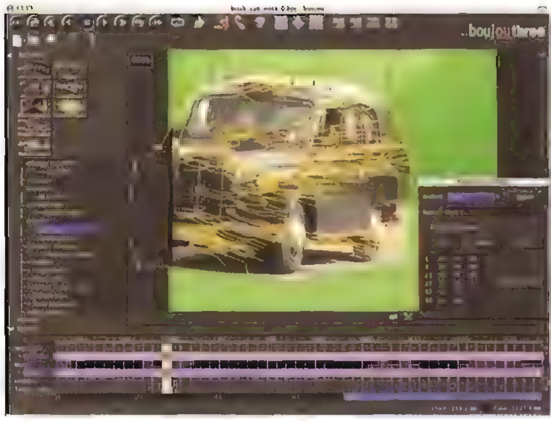
boujou 3 includes improved user input in a number of areas, including manual settings for tracking parameters such as size and tolerance of tracks, and colour channel options

At the vanguard of this digital revolution, along with a very few others, was an Oxford-based company called 2d3. Its flagship application *boujou* premiered at NAB 2001, and quickly became popular with overworked 3D artists. The software greatly enhanced the range of possibilities available to 3D and compositing artists, while slashing the time needed for many tasks from weeks to hours, and the film and effects community in Hollywood duly awarded 2d3 and *boujou* a Primetime Emmy Engineering Award in 2002.

Because of its auspicious beginnings *boujou* is still considered to be a leader in this field, and certainly, in terms of its market profile and wide customer base, it appears to be. But things have moved on at great pace since those heady Emmy-winning days, and the market is now full of credible competitors driving prices down while at the same time developing the technology. While others have introduced considerable improvements and extra functions to their



Despite a new optimised tracking engine, *boujou* can still be unreliable at the first sign of motion blur or less-than-smooth camera movement



boujou 3 has a built-in facility for creating custom mattes; this is useful when you need to concentrate the track in a limited area of the frame

DETAILS

PRICE
- £5,190* / $10,000 / €7,580*
- Upgrade from *boujou 2* £1,038* / $2,000 / €1,495*
- Upgrade from *bullet* £3,920* / $7550 / €5,725*

* Currency conversion

PLATFORM
PC / Mac / Linux

MINIMUM SYSTEM
PC
- Windows 2000 / XP
- 800MHz Pentium III processor
- 500MB RAM

MAC
- OS X 10.3
- G4 processor
- 500MB RAM

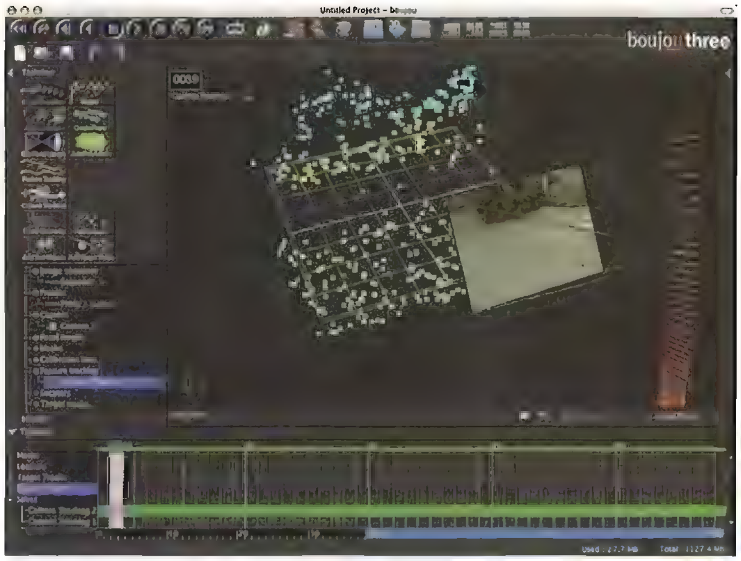
LINUX
- Red Hat Linux 7.2+
- 800MHz processor
- 500MB RAM

MAIN FEATURES
- Improved tracking speeds with rebuild of tracking engine
- Better at tracking free-move shots with variable focal length
- Greatly improved, redesigned interface improves ease of use
- Matte import ability or creation using built-in tool.
- Built-in wizard helper
- Expansion of user-assisted tracking, including survey data input facility

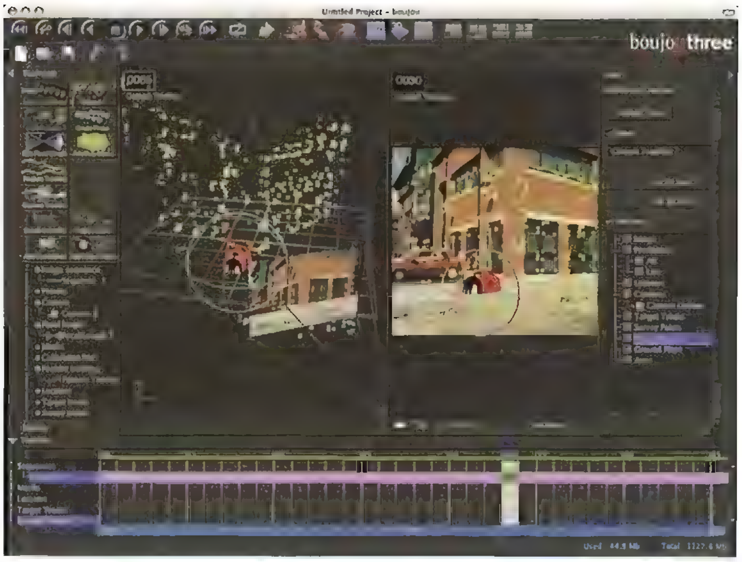
DEVELOPER
2d3

WEBSITE
www.2d3.com

RELATED PRODUCTS
- *PFTrack 2.0* Reviewed: Issue 57
- *MatchMover Pro 3.1* Reviewed: Issue 63



● Within the 3D view, mouse clicks enable you to orientate your camera data to the position most useful to you after export to a 3D system. Camera movement can be displayed on a per-frame basis



● A number of primitives are available to test within your calibrated scene. It's also possible to split the viewing area, *and* synchronise both windows to better judge the orientation of your scene

tracking products over the past year or so, 2d3 introduced a simpler and far cheaper version of its *boujou 2* software, *boujou bullet*, which was essentially a less attractive, less well-equipped version of the original, while its much-talked-about *boujou 3* remained as elusive as pixie dust.

Now *boujou 3* has arrived, along with an improved version of *boujou bullet*. Coming almost two years after the last major upgrade, one would expect a great deal from this Leviathan of the fleet and, with claims of being ten times faster, and packaged all in black, it certainly walks the walk. A number of new features had been promised, while wishful thinking on the part of the 3D community had morphed into Chinese whispers about certain improvements, not least a long-awaited object tracking facility.

2D3'S SUCCESS SEEMS TO BE DUE LESS TO INNOVATION THAN TO A LOYAL CUSTOMER USER BASE

This is definitely a new-look *boujou*. The completely redesigned user interface is immediately impressive, although you might be forgiven for mistaking it for The Pixel Farm's *PFTrack*, to which it bears an uncanny resemblance, right down to the cool, neutral charcoal colour scheme. The organisation follows a more intuitive workflow, and its components feel easier to access. The interface is extensively customisable, with clear indications of all the options available, and those you have employed are listed in the taskview window, the list is complemented by a concise written summary beneath the main viewing area.

One rather curious new feature is a keyframable interactive timeline, offering visual clues to the progress of elements that might be in play throughout a sequence, such as Target or Locator tracks, camera tracking, masks and so on, together with a bigger graphic display that can be made to fill the entire viewing area. Certainly these will help you to identify specific areas where there may be a problem, but that's where you're left. These are not editable graphs, so you can't simply address the problem you've identified by tweaking the correct line in the graph; you must go back to your footage and attempt a more time-consuming, hands-on f.x.

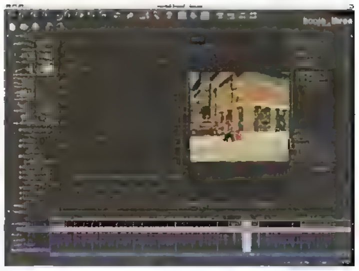
Furthermore *boujou 3* has not delivered an automated object tracking component; neither has it provided for automatic lens distortion correction (this is promised in 3.1, along with planar scene restraints). Thankfully this upgrade does include an automated solution for tracking free-move zoom shots, which isn't perfect, but is fairly reliable. It does now allow for image proxies, although not truly resolution independent ones that can be created on the fly.

THE ENGINE ROOM

It's also surprising that a simple set of image manipulation tools isn't present. One of the biggest problems with any auto-tracker is the quality of the footage. Factors such as poor lighting, motion blur and low resolution can all make tracking difficult. If you could de-noise, sharpen, or increase contrast of the footage prior to tracking it would make the difference between a good and bad track.

The new feature-tracking engine is a real improvement, and regular users will notice a speed increase, and perhaps a greater robustness during tracking, although not so much in solving, and certainly not a 'tenfold' improvement. A checkbox in the Feature Tracking Properties dialog does offer the option of Fast Tracking, although this is at the expense of accuracy, since to achieve improved times this mode simply employs fewer tracks. Possibly this is what 2d3 had in mind when it talked of a tenfold increase in speed.

There's no doubt that *boujou* is among the best tracking applications available, it will provide sound camera solves most of the time. However this technology is moving rapidly beyond mere match-moving, towards the goal of the total metadata model of the image through technologies such as floating-point optical flow analysis from companies such as The Pixel Farm and The Foundry. Such technology tracks every single pixel, and can repurpose the data for practically any 3D requirement, by contrast 2d3 still struggles to offer lens distortion correction. Its continued success seems to be due less to innovation than to a loyal user base that has been with the company from the start, and for them this much-delayed and largely unsurprising upgrade may prove to be something of a disappointment ●



● Frustratingly, *boujou 3* provides a full graphic analysis of your shot, but doesn't allow for editing from the graph to correct problem areas

VERDICT

PROS
- More intuitive interface
- Useful wizard helper
- Enhanced user input facilities

CONS
- Limited image enhancing options to improve tracks
- Expensive

RANGE OF FEATURES	7
VALUE FOR MONEY	6
OVERALL	6

boujou bullet

It may not have the range of its bigger sibling, but this $2,500 package is still a capable performer when it comes to 3D film tracking

BY MARTIN SOUTHWOOD

DETAILS

PRICE
- £1,307* / $2,500 / €1,896*

*Currency conversion

PLATFORM
PC / Mac / Linux

MINIMUM SYSTEM
PC
- Win 2000 / XP
- 500MB HD

MAC
- OS X 10.2 / 10.3
- 500MB HD

LINUX
- Red Hat Linux 7.2 / 7.3 / 8.0 / 9.0
- Fedora Core
- 500MB HD

MAIN FEATURES
- Automatic Tracking
- Wizard helper
- Import images at any resolution
- Multiple camera solutions
- Built in mask creation or import mask images
- Constrain animation to camera, scene geometry or panning camera and translating scene geometry
- Image window can be split to show up to four panes, allowing alternative overlays, different time frames in 3D and 2D views

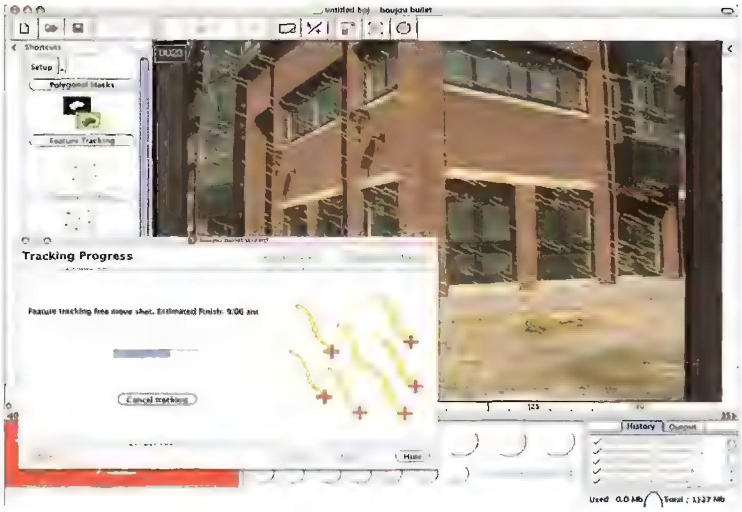
DEVELOPER
2d3

WEBSITE
www.2d3.com

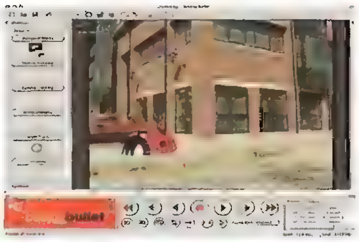
The curse of younger siblings means that they tend to inherit elements of their elders' wardrobes. But in the world of 3D, 2d3's *boujou bullet* has benefited from its big brother's hand-me-downs. As *boujou 3* has grown a little, a good deal of its previous incarnations' feature set has been handed on to *bullet* and, with the commercial value of professional 3D camera matchmoving software being increasingly driven down by competition, *boujou bullet*'s subsequent improved import capability and toolset make its $2,500 price tag a little more palatable.

Unfortunately, *bullet* hasn't had the radical interface makeover its elder sibling now sports so well, but keeps its quite garish and simplistic appearance. But one can forgive it that if you scratch below the surface. Besides, you can fully customise the appearance to fully suit your taste or monitor space. Once inside this application, it soon becomes apparent this is no lightweight tool. In fact, now that it's capable of dealing with almost any resolution or type of footage, together with the fact that it permits user intervention at every step of the tracking process, *boujou bullet* suddenly looks like a much more competitive proposition at this price point.

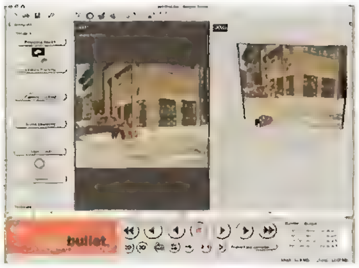
Introduced with *boujou bullet* last year was the so-called 'Wizard'. Designed to guide the user through the application from import to export, via a series of interactive pop-up dialogues, it helps the user troubleshoot any problems along the way. This feature is very useful and has been improved along with the interface so that even an inexperienced user will be able to obtain competent results from an uncomplicated clip. Of course, if you don't fall into this category you can always disable the Wizard.



● *boujou bullet*'s Wizard dialogue boxes guide the unaccustomed user through the process of setting basic parameters prior to tracking and offer help throughout the tracking and solving



● Before you export your footage to a 3D app, it's possible to insert one of the available 3D primitives into the scene to check orientation



● Footage can be viewed in a single window which can be toggled with the 2D image, or as a split view alongside the 2D image

TRACKS AND MATTES

To help with complicated shots, *bullet* has a decent toolset. The user can implement Target and Gold tracks to assist the auto track engine although, unlike the full *boujou*, *bullet* doesn't provide for survey data input. To target specific areas of your shot it's possible to import your own mask image or you can use the built in Matte Creation tool.

The fine-tuning options you'll find in the full *boujou* aren't always available in *bullet*. For example, you can't specify individual track parameters before you start. Instead, there are default options of standard or thorough. But options to semi-automatically correct for lens distortion, specify frame range and even smooth the camera path do allow for a reasonable level of user control.

bullet has real problems with free-move zoom shots and there's no real provision for the user to help the situation. However, tricky shots containing camera motion or motion blur can usually be helped along with user Added tracks or Gold tracks.

Although *boujou bullet* is primarily aimed at the smaller post facility, or perhaps independent production facilities, it wouldn't look out of place as an accompaniment in a larger facility either. It'll import virtually any footage, has a good fundamental tracking engine and may be sufficient for a lot of projects by itself, and at a fraction of the cost. ●

RELATED PRODUCTS

- *PFMatch 1.5*
Reviewed: Issue 57
- *MatchMover Pro 3.1*
Reviewed: Issue 63

VERDICT

PROS
- Good basic 2D and 3D tracking
- Accepts any resolution footage

CONS
- Unreliable with zoom shots
- No density or colour channel control

RANGE OF FEATURES	**6**
VALUE FOR MONEY	**7**
OVERALL	**7**

Ornatrix 1.1

Just as Discreet adds built-in hair functionality to max 7.5, a new hair-generation plug-in steps into the market. Will Ornatrix 1.1 make the cut?

BY CHRIS OLLIS

Sample images generated using *Ornatrix 1.1*, the latest hair-creation plug-in for *3ds max*. Texture maps can be applied to govern various properties, including the colour and location of hair

Ornatrix is a brilliant example of how plug-ins should be made. Roughly a year ago, *3ds max* user Marsel Khadiyev decided to give up work and focus solely on the problems he was experiencing with hair generation in the program.

After much investigation and hard work, a plug-in was born, which Khadiyev decided to let loose on the general public as *Ornatrix Beta 0.1*. Understandably, the free hair plug-in was snapped up by fellow users, many of whom took it under their own wings, tested it and offered their opinions. This feedback was poured back into the program. Six months later, version 1 was born, and *Ornatrix* was ready to go pro.

Unlike *hairfx* (*3ds max*'s other hair solution) *Ornatrix* instantly populates a selected scalp with a mass of hair for you to interactively grow, comb, cut, part, twist or mess up to get the style you're after. This instant hit of hair is immensely satisfying, while it can still take time to style to perfection, the real-time feedback gives the sense that you're getting where you want to be very quickly.

The workflow for creating your style is cleverly controlled by the Modifier stack. As soon as you've selected your scalp, 15 new Modifiers are available to add properties such as Curling, Clustering, Frizz, Length and Gravity to the hair strands. Breaking the myriad features of a hairstyle into these categories makes a change from the usual all-in-one plug-in interface. It also enables you to concentrate on the options required for each haircut. For those who like a minimal amount of fuss in their stack, this isn't a problem, the various modifiers can be collapsed into a final hair state, which can also be exported (and imported) via a .OXH format – perfect for passing haircuts between scenes.

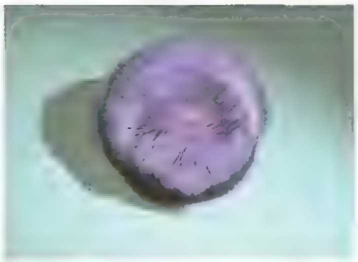
CHOOSE YOUR STYLE

One area that's particularly impressive is the dynamic simulation. Anyone who's struggled with hair dynamics will be glad to see how simple *Ornatrix* makes the process look. The dynamics calculations are fast and accurate, with a variety of settings to help simulate any hair type, from 'glossy shampoo advert' to 'Leo Sayer'.

One other facet of the program to note is the Help file. It's always pleasing when a package provides an understandable and enlightening guide, instead of a baffling index of subjects and commands. In the case of *Ornatrix*, the Help file offers concepts on dynamics, hair coverage and the way shadows work. The tutorials are well paced (with a fantastic demo model from Song Hwasup), the MAXscript support is positive, and the overall feeling is of someone asking you round for tea and letting you in on a great secret.

Already at version 1.2, *Ornatrix* looks set to work well in it's field, thanks to its ease of use and intuitive workflow; the fanbase is certain to grow as users discover how easy it is to generate intricately coiffured *max* characters. But should you jump on board now, and take advantage of the introductory price, or hang on to see what Discreet's free *Hair and Fur* extension can do when *3ds max* users finally get their curling tongs into it? ●

The viewport display provides real-time feedback on your brushing and styling



Sink objects can be used to attract or repel hair from selected areas – ideal for bald spots

VERDICT

PROS

- Instant results
- Believable hair dynamics
- A lot of fun to use

CONS

- Can be twitchy when solving dynamics

RANGE OF FEATURES	**9**
VALUE FOR MONEY	**10**
OVERALL	**8**

DETAILS

PRICE
- £82* / $149.99 / €114*
- Asterisk denotes currency conversion at current rates

PLATFORM
- PC

MINIMUM SYSTEM
- Any system capable of running *3ds max* 6 or 7

MAIN FEATURES
- Apply hair to any surface or spline
- Real-time feedback of hair creation and adjustment
- Huge variety of styling tools to cut, comb and braid your hair
- Includes a Grass primitive for instant meadows
- Use proxy mesh objects to create anything from feathers to forests
- Excellent dynamics simulation
- Works with external renderers such as *Brazil*, *mental ray* and *V-Ray*

DEVELOPER
Ephere

WEBSITE
www.ephere.com/ornatrix

RELATED PRODUCTS
- *Shave and a Haircut*
Reviewed: Issue 52

ANARK®

Anark Studio 3

This release comes with new features, a polished interface and a hefty price tag. So can Anark crack the high-end 3D visualisation market?

BY MIKE DE LA FLOR

DETAILS

PRICE
- Full version $3,499 / £1,835* / €2,664*
- Upgrade $1,499 / £785* / €1,141*

* Currency conversion

PLATFORM
PC

MINIMUM SYSTEM
- Pentium III 600MHz
- Windows 2000 or XP
- 256MB of physical RAM
- DirectX 7
- Windows Media Player 7
- 400MB free hard drive space

MAIN FEATURES
- AMX plug-ins for 3D data import
- Extensive support for 2D graphics formats
- Extensive support for video/audio formats
- Drag-and-drop scene building and scripting
- Real-time 3D engine
- Layers and Scenes
- Advanced materials editing
- Video mapping onto 3D geometry
- Keyframe-based animation
- Predefined special effects and interactivity scripts

MAIN NEW FEATURES
- Text Object
- Slides
- Dynamic loading of Playback Modules
- Actions
- XML integration

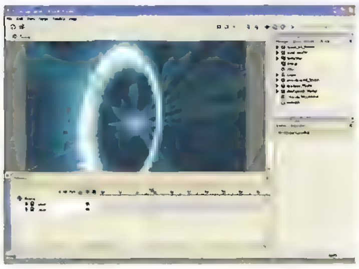
DEVELOPER
Anark Corporation

WEBSITE
www.anark.com

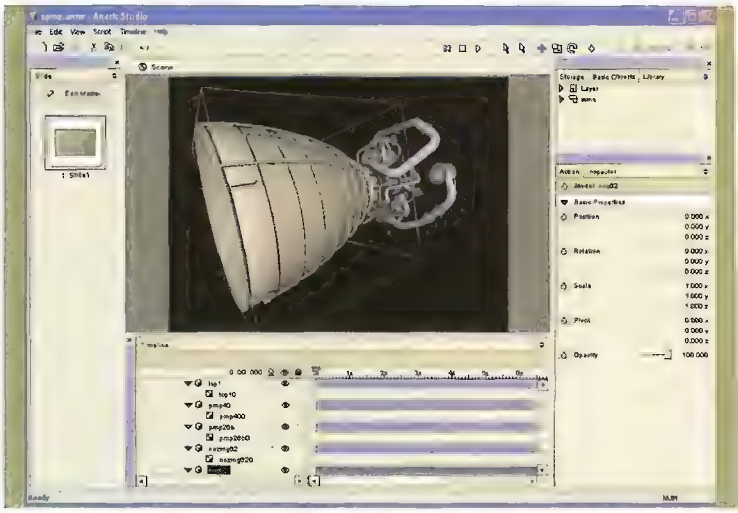
Since its release in 2002 *Anark Studio* has been a popular solution for developing real-time, interactive 3D applications for training, education, visualisation, marketing and game development. Much of its appeal to both large and small users has stemmed from its power, ease of use, affordability and Mac/PC compatibility. However, the release of *Anark Studio 3* brings with it more than just new features, as Anark announces major changes in pricing and target market, and drops Mac support.

The *Anark Studio* interface has been given a much-needed makeover. Interface components now look as if they belong together, and are all part of one application. Palettes can be resized in unison, and easily docked, undocked and hidden. The most notable of these is the new Slides palette, which is accommodated along the left side of the interface. Overall, the new interface is stable, conforms to expected standards and should greatly boost productivity.

A significant upgrade from version 2.5, *Anark Studio 3* ships with dozens of new features and bug fixes. The long-awaited Text Object makes it possible to create and edit clear text directly inside the application. This version also sees Anark take a giant leap forward into enterprise-level application development with XML integration, which allows data from outside sources to be passed into *Anark Studio*, making the creation of dynamic Anark media possible. The new Actions and Events features will be popular with non-programmers, as they enable you to add interactivity functions without the need for any programming.



Version 3 sports a reworked interface, and many new features such as XML integration, the Text Object, Actions and Playback Modules



Anark Studio makes it simple to build complex, real-time 3D applications for training, education and game development. Version 3 sees Anark moving into the high-end visualisation market

Anark Studio media can be used to develop a wide range of content for the web, video, CD-ROMs, DVDs and screensavers

Common among authoring programs such as *Director* and *Flash* is the facility to load proprietary media into a running presentation, which makes building and managing large, dynamic presentations possible. This important feature was missing in previous versions of *Anark Studio*. However, version 3 is able to dynamically load and play *Anark* files on the fly within a running presentation. Also debuting in *Anark Studio 3* are Slides; these keep complex presentations organised during the authoring process, and can be used to perfect timing and build interactivity.

AIMING HIGH

When first released, *Anark* was generally categorised as a new authoring tool for artists similar to *Flash*, but with 3D capabilities. However, *Anark Studio*'s new features, greatly increased price of $3,499 (from $999), and focus on the PC platform indicate a repositioning of the product away from authoring for artists into high-end 3D visualisation for manufacturing, engineering and medicine. *Anark Studio* may face a tough battle to break into this market, as established products such as *Lattice3D* and *EON Professional* already provide extensive 3D visualisation solutions. In addition, *Anark Studio* will have to compete with rival *Quest3D*, which is also seeking to get a foothold in this lucrative territory.

There's no doubt that *Anark Studio* is a powerful solution for developing large-scale, real-time 3D applications. However, Anark's move into a new market, the much higher price and absence of support for the Mac will leave many existing users high and dry ●

VERDICT

PROS
- Shallow learning curve
- Improved interface
- Improved application development

CONS
- Expensive
- No Macintosh support
- No printed manual

RANGE OF FEATURES	8
VALUE FOR MONEY	7
OVERALL	8

RELATED PRODUCTS
- *WireFusion 4*

Reviewed: Issue 56
- *Quest3D 2.1*

Reviewed: Issue 48

Magpie Pro 2.1

Magpie Pro makes the tedious job of lip-synching achievable for the novice, and streamlines the whole process for the veteran animator

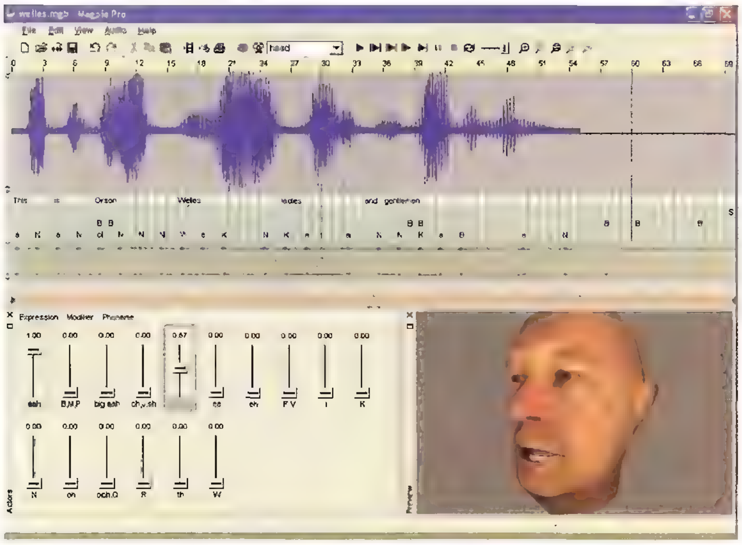
BY MIKE DE LA FLOR

Rapidly emerging as a favourite among novice and seasoned animators alike, *Magpie Pro 2.1* has been used extensively for lip-synching in amateur short films, feature films and television production. Notably, it was used by DNA Productions in the feature film *Jimmy Neutron: Boy Genius*, and it's currently being used in the new Tim Burton film *Corpse Bride*.

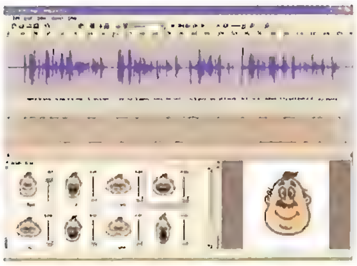
Much of *Magpie*'s user-friendly and customisable interface is taken up by a frame-based timeline that also displays the audio waveform. The Actors window displays all possible morphs, and the Display window shows the character. *Magpie* supports OpenGL, making the preview of fully textured models possible.

A *Magpie* project typically begins with you importing the WAV or MP3 file that will be the guide for lip-synching. Next, all 3D morphs needed for the speech animation must be modelled in your favourite 3D application, and imported into *Magpie*. The morphs comprise the actor's range of poses, and are represented in the Actors window as sliders. Morphs are organised during the import via a dot notation naming convention. Note that *Magpie* isn't limited to lip-synching; depending on the morphs, it's possible to animate a range of other facial features.

Once the audio and actor are in place, you can either let *Magpie* automatically lip synch the audio with the actor via the recognition function, animate manually by scrubbing through the audio and setting keyframes, or use a combination of both. To refine automated recognition, *Magpie* can also analyse a text file.



Whether you use the automatic recognition function, manually set keyframes or use a combination of both, *Magpie Pro* streamlines the task of lip-synching and other facial animation



Magpie Pro isn't limited to animating 3D characters - you can lip-synch, and animate other facial features, in 2D as well

Getting animation data out of *Magpie* and into a supported 3D application requires some scripting. *Magpie* exports animation data as a text file, and to apply the data to the character in *3ds max* (for this review *3ds max* was used as a test bed), the data file must be referenced via a MAXScript installed with *Magpie*. While this may put off the programming challenged, in reality it's a simple process that involves editing a few variables. Using a script to import animation data opens up many possibilities for customisation and extensibility; having said that, it would be great if *Magpie* had a no-scripting export/import option.

Many lip-synching and facial animation applications are either plug-ins for specific software, such as *Voice-O-Matic* for *3ds max* and *Mimic* for *LightWave*, or are designed for a single purpose, such as use in real-time game engines. In contrast, *Magpie* is a standalone, full-featured solution that can be used for multiple animation tasks. Unlike its competition, *Magpie* produces both 2D and 3D animation, and is designed to work hand in hand with *Maya, 3ds max, LightWave, Cinema 4D, messiah, Animation:Master, Mirai, PiXELS 3D, Softimage|XSI, After Effects* and *Flash*.

At $250 for a single licence *Magpie* is an excellent investment; it'll pay for itself many times over in time saved. It's available as a download from the developer's website, and comes with web-based help (although a little more documentation would be nice). There's no telephone support yet, but user forums and free email help are available. ●

Magpie Pro has a proven track record as a professional-level production tool, and has been used in television and feature films

VERDICT

PROS
- 2D and 3D animation
- Shallow learning curve
- Works with many 3D apps

CONS
- Needs more documentation and tutorials
- Export requires scripting

RANGE OF FEATURES	8
VALUE FOR MONEY	9
OVERALL	9

DETAILS

PRICE
- £131* / $250 / €190*
- Upgrade from version 1 £42* / $80 / €61*

*Currency conversion

PLATFORM
PC / Mac

MINIMUM SYSTEM
PC
- Win 98 / 2000 / ME / XP
- Pentium or compatible processor
- 64MB RAM
- 16MB graphics card with OpenGL

MAC
- Mac OSX 10.2
- G3, G4 or G5 processor
- 64MB RAM
- 16MB graphics card with OpenGL

MAIN FEATURES
- Many media formats supported: MP3, WAV, AIFF, MOV, AVI, PSD, JPG, LWO, 3DS, and so on
- Multiple actors per project
- Pose sliders
- Advanced audio playback and scrubbing
- Real-time preview
- Automatic speech recognition
- Reference video
- Animation Curve editor
- Animation export
- Customisable interface
- Extensible with scripting

DEVELOPER
Thirdwish Software and Animation

WEBSITE
www.thirdwishsoftware.com

RELATED PRODUCTS
- *Mimic 2 Pro*

Reviewed: Issue 43

DETAILS

AUTHOR
Bowman et al

PUBLISHER
Addison Wesley

PRICE
£34* / $64.99 / €49*
(*Currency conversion)

PAGES
478

ISBN
0-201-75867-9

3D User Interfaces

While most of us are quite happy using 2D interfaces to interact with software and can barely imagine another method, there are those (like this book's authors), who can't only imagine, but have thought a great deal about, the viability of, possibilities presented by and programming requirements for 3D interfaces.

While you can't help but be seduced by the central premise of this book that 3D interfaces are inevitable, so we'd better get our heads round them pronto – the implication that the explosion of 3D interfaces is going to revolutionise the way we interact with computers in our everyday lives any moment now is a little OTT. And while the book offers a considered set of predictions and earnest design guidelines, the dissertation-like presentation and the price tag preclude it from appealing to the sci-fi futurist/casual 3D artist with a passing interest in the subject. ●

VERDICT
A comprehensive, though at times ponderous book, often guilty of preaching to the converted **7**

DETAILS

AUTHOR
Tom Miller

PUBLISHER
SAMS Publishing

PRICE
£24.99 / $34.99 / €27*
(*Currency conversion)

PAGES
418

ISBN
0-672-32661-2

Beginning 3D Game Programming

This is a wide-ranging guide that deliberately doesn't restrict itself to the notion that games design has to be a committee affair. Yet, as he takes you through the construction of two 3D games from scratch, Tom Miller (designer and development lead for the DirectX API) offers useful information from the frontlines of the games industry to contextualise your efforts.

And you do get your hands dirty early on, with an intro to .NET, the framework you'll be writing your applications in. From there things progress fairly logically, taking in every facet of the process, starting with planning. The author has included a basic maths primer chapter, and there's even an ambitious assault on understanding the Higher Level Shader Language and performance enhancements using DirectX. The chapters urge frequent trips to the enclosed CD, which provides all the apps you need, to supplement the exercises ●

VERDICT
A clear and considerate beginner's guide, written in an encouraging manner **8**

DETAILS

AUTHOR
Dariush Derakhshani

PUBLISHER
Maya Press

PRICE
£24.99 / $34.99 / €27*
(*Currency conversion)

PAGES
362

ISBN
0-7821-4353-9

Introducing Maya 6 3D for beginners

The founding principles of a 'beginner's guide' to anything 3D are: don't blind your reader with science and terminology; show, don't tell; and, to start with at least, take it s-l-o-w. Dariush Derakhshani does all this and more in an engaging style that's aided by the book's simple design.

Early projects, such as animating our solar system, are fun, and offer near instant rewards. If there's a criticism to be levelled, it's that later workouts such as 'Throwing an axe' seem less than inspiring at a glance, although of course we all know the virtues of keeping things simple when dealing with the fundamentals of keyframing animation.

Where this book excels is in its patient and unflustered elucidation of complex topics such as texturing and lighting: anyone who's tried to write or read tutorials aimed at beginners will instantly appreciate how hard it is to go at the right pace while keeping the style fresh and approachable ●

VERDICT
A crystal-clear introduction to *Maya*, only let down by some pedestrian exercises **9**

DETAILS

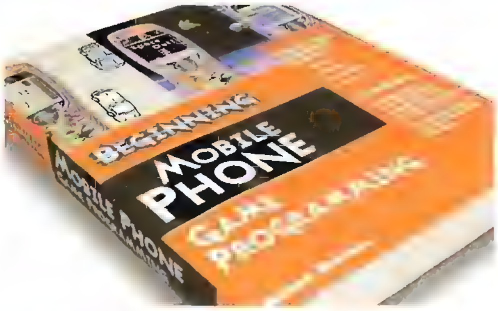
AUTHOR
Michael Morrison

PUBLISHER
SAMS Publishing

PRICE
£24.99 / $34.99 / €27*
(*Currency conversion)

PAGES
506 pages

ISBN
0-672-32665-5



Beginning Mobile Phone Game Programming

Starting from the standpoint that while mobile phone games are in their infancy, they're also here to stay, Michael Morrison launches straight into programming five games in Java with the J2ME Wireless Toolkit (and there's a Java Programming Primer on the CD for good measure).

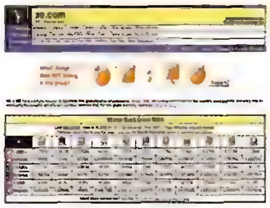
The projects are attractive-looking, and the book ticks all the boxes in terms of developing them. But most interesting is the chapter on taking advantage of wireless networks, which, by offering a step-by-step guide to creating a Connect 4 game over a two-person network, offers a glimpse into the world of mobile gaming's killer app – the interconnected gaming network. It's almost guaranteed to get you thinking about ways to use your new-found knowledge to create a fantastic network game that'll make you rich, rich, rich. Elsewhere, the chapter on A.I. offers a concise and unflustered introduction to the essentials of that subject. ●

VERDICT
Next time you're tempted to play games on the train, put the phone away and read this instead **9**

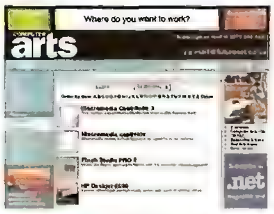
Buyers' guide

Whether you want advice on choosing a specific software package, or an overview of what's on the market, this database of past 3D World reviews contains the information you need to make the right buying decision

Online Resources



This guide lists prices in Pounds Sterling and US Dollars. For a quick currency conversion: www.xe.com



We don't cover non-3D software. For full reviews of complementary products: www.computerarts.co.uk

When new 3D users contact the magazine, the most common question they ask is: "Which software package should I buy?" To which the honest response is: "That really depends on you."

Unlike Web design or 2D illustration, there's no single, well-established software package that all professionals use. Instead, choosing a 3D application is largely a matter of personal requirements, not to mention individual taste. Before you begin downloading demos, however, it does help to have a broad overview of what's available – and that's where this buyers' guide comes in.

In this guide, you'll find a list of the key software packages in a particular market sector, the issue of the magazine in which each one featured and a brief summary of the review. These summaries represent a single reviewer's opinion, but they should give you an idea of the key characteristics of each application.

QUESTIONS, QUESTIONS...

Before diving in, there are two fundamental questions you should ask. Firstly, are you pursuing 3D as a professional career? And secondly, what kind of 3D work do you aim to produce?

If the answer to the first question is 'no', the only limitations on your choice of 3D software are your budget and operating system. In the hands of a skilled user, inexpensive applications can generate impressive results, although they might not do so as quickly as more expensive software (or in a way that professional 3D artists would deem conventional).

If you do aim to make a living in 3D, however, you'd be well advised to pick a 'professional' application – those listed in the upper table on the page opposite. Expensive packages don't necessarily generate better results, but they tend to produce work quickly, flexibly and reliably – all important issues if deadlines are looming. And while studios don't usually hire staff solely on the basis of the software they've used, mastering a 'name' application will familiarise you with high-end tools and increase your chances of freelance work.

Another consideration is whether you intend to produce animations or still images. As a crude generalisation, illustrators and graphic artists often favour pro applications at the lower end of the price scale, while those working in animation, visual effects or game design tend to opt for more expensive packages.

Ultimately, however, there's no substitute for hands-on experience. All major applications have demo versions that you can download and experiment with, and before you reject the more expensive packages, remember that many of them – particularly *Maya*, *Houdini*, *LightWave* and *Softimage XSI* – have free 'learning' editions. Educational deals also offer students the chance to buy full versions of professional software for the price of a handful of DVDs – to see if you qualify, check the website of the software package you're interested in.

Fortunately, there are very few 'bad' 3D packages on the market, so choosing the right one for you ultimately comes down to personal taste. Do your research, consult the magazine, and be prepared to experiment – but above all, enjoy yourself!

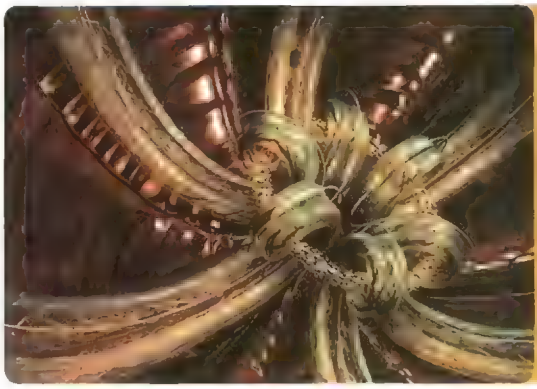
CHOOSING APPLICATIONS IS ALL ABOUT PERSONAL REQUIREMENTS AND INDIVIDUAL TASTE

ALL-ROUND 3D PACKAGES (UNDER £250)

AIST MOVIE 3D	PC	Cut-down version of [illegible] aimed at [illegible] makers dabbling in 3D	£68* ($132*)	AIST	www.aist.com	N/A	[Not previously reviewed in *3D World*]	**N/A**
CARRARA 3D BASICS	Mac/PC	Extremely stripped-down version of a mid-price app aimed at hobbyists and casual users	£39 ($49)	Eovia	www.eovia.com	N/A	[Not previously reviewed in *3D World*]	**N/A**
CARRARA 4 STANDARD	Mac/PC	Inexpensive all rounder, lacking some of the high-end tools from *Carrara 4 Professional*	£209 ($279)	Eovia	www.eovia.com	60	Still a solid purchase for a novice all-round 3D [illegible] 4 fixes bugs from earlier versions, but lacks the new [illegible]	**8**
GAMESPACE	PC	Cut-down *trueSpace* with extra games tools: aimed at modders and indie game developers	£154* ($299)	Caligari	www.caligari.com	46	Goes some way to providing a one-stop solution for the mod community, but one with rough edges on release: those on a real budget may stick to freeware	**7**
HASH: ANIMATION:MASTER	Mac/PC	Cult entry-price animation app chosen by many leading animators for personal work	£154* ($299)	Hash Inc.	www.hash.com	59	Powerful, intuitive rigging and animation [illegible] versatile modeller. Now adds hair support [illegible]	**9**
PIXELS 3D 5	Mac	The premier – and possibly, only – Mac-only 3D package: a cult app amongst Mac fans	£77* ($149)	Pixels Digital	www.pixelsdigital.com	42	Great value for money, and includes a number of high-end tools, including fluids and cloth. Good render quality, but very slow, and workflow could be improved	**8**
REALSOFT 3D 4.5 (FOR LINUX)	Linux	Even better value than the PC edition: most Linux users' main alternative to freeware	£140* ($270*)	Realsoft Graphics	www.realsoft.com	35	Excellent render quality for the price, but more suited to still images than animation work, particularly character animation. OpenGL could be improved	**9**
SHADE 7 DESIGNER LE	Mac/PC	Very inexpensive, if limited, all-round package: extremely popular with hobbyists in Japan	£56* ($109)	Curious Labs	www.curiouslabs.com	58	Clearly geared towards the student or amateur, this cheap and cheerful version of its bigger siblings shares the basic modelling tools but is otherwise limited	**7**
SHADE 7 STANDARD	Mac/PC	[illegible]	£107* ($209)	Curious Labs	www.curiouslabs.com	58	[illegible]	**7**

ALL-ROUND 3D PACKAGES (OVER £250)

3DS MAX 7	PC	Long-established 3D package still a standard in the games and architecture industries	£2,695 ($3,495)	Discreet	www.discreet.com	59	No major 'hero' features, but improved stability, integrated *character studio* and new Normal Mapping and character animation tools make this a worthy upgrade	9
CARRARA 4 PRO	Mac/PC	Inexpensive all-round app, now targeted more specifically at professional illustrators	£419 ($579)	Eovia	www.eovia.com	60	Retains Eovia's unique – and possibly offputting – system of workflow divided between 'rooms' but dramatically improves animation and high-end rendering	8
CINEMA 4D 9 BASE	Mac/PC	Entry-level edition: only some important tools must be purchased as add-on modules	£425 ($695)	Maxon	www.maxon.net	58	Not as ground-breaking an upgrade as version 8, but builds on previous incarnations to deliver a capable all-round professional 3D package	9
CINEMA 4D 9 XL	Mac/PC	A powerful renderer makes this increasingly respected app the choice of many illustrators	£1,148 ($1,895)	Maxon	www.maxon.net	58	[This edition not specifically reviewed in *3D World*] Pricier than *LightWave* but the MOCCA and Advanced Render modules are essential to many pro artists	9
CINEMA 4D 9 STUDIO	Mac/PC	Top-level edition of *Cinema 4D*, adding in *BodyPaint 3* and unlimited network rendering	£1,871 ($2,995)	Maxon	www.maxon.net	58	[This edition not specifically reviewed in *3D World*] Primarily for large facilities needing unlimited render licences, although *BodyPaint* is a useful added extra	9
EIAS 5.5	Mac/PC	Perennial professional-quality animation package with a strong cult following	£463* ($895)	EI Technology Group	www.eitechnologygroup.com	59	Still an insanely fast rendering and animation package, but now minus a built-in modeller since the last – admittedly thorough – point-five upgrade	8
HOUDINI 7 SELECT	PC/Linux	Entry-level edition primarily aimed at studios looking to build a lower-cost *Houdini* pipeline	£825* ($1,599)	Side Effects Software	www.sidefx.com	25	[Reviewed at version 5] A good additional seat for a *Houdini* studio, but lack of advanced and character animation tools limits its use as a standalone package	7
HOUDINI 7 MASTER	PC/Linux	Powerful procedural animation package: few skilled users, but a staple of much VFX work	£8,769* ($17,000)	Side Effects Software	www.sidefx.com	41	[Reviewed at version 6] Retains all the power of previous versions but makes considerable advances in terms of ease of use. Also adds GI rendering	8
LIGHTWAVE 3D 8	Mac/PC	Another long-established package used in a wide range of work, notably TV effects	£595 ($1,595)	NewTek	www.newtek.com	53	Vastly improves character animation and dynamics, and streamlines workflow, but leaves the renderer and underlying structural problems of the app untouched	8
MAYA 6 COMPLETE	Mac/PC/Linux	Lacks some high-end tools, but an affordably priced edition of *Maya* for many 3D markets	£1,499 ($1,999)	Alias	www.alias.com	52	Despite better *mental ray* and *Photoshop* integration and a 'soft modification' modelling tool, *Maya 6* features relatively little new for users of *Complete*	8
MAYA 6 UNLIMITED	Mac/PC/Linux	Powerful all-round package: still the one to beat when it comes to film effects work	£4,899 ($6,999)	Alias	www.alias.com	52	Powerful new 'dynamic curves' tools (for hair), and improved cloth, particles and animation editing make *Maya 6* a much stronger proposition for *Unlimited* users	8
REALSOFT 3D 5 (FOR PC)	PC	Underpublicised, but well regarded, mid-priced application; good built-in renderer	£415* ($795*)	Realsoft Graphics	www.realsoft.com	61	Enhanced Sub-D modelling and texturing make this a viable alternative to better-known 3D illustration apps. Still weak at character animation, however	9
SHADE 7 PRO	Mac/PC	Very popular Japanese package. Still relatively unknown in the West but may gain ground	£521* ($1,009)	Curious Labs	www.curiouslabs.com	58	Robust modelling tools and a reasonably powerful renderer, but the interface and animation tools will seem unconventional to many Western 3D artists	7
SOFTIMAGE|XSI 4 FOUNDATION	PC/Linux	Aggressively marketed entry-level edition of a leading 3D app: very powerful for the price	£299 ($495)	Softimage	www.softimage.com	55	Fuller featured than many entry-level editions of major packages. *Foundation* – originally sold for $1,995 – sets a new benchmark for 3D software pricing	9
SOFTIMAGE|XSI 4 ESSENTIALS	PC/Linux	Powerful, well-balanced all-round package, also much reduced in price over the last year	£1,275 ($1,995)	Softimage	www.softimage.com	55	A solid upgrade to a powerful package, adding new rigid body dynamics, a fully non-linear modelling workflow and improved texturing and materials tools	9
SOFTIMAGE|XSI 4 ADVANCED	PC/Linux	Widely used in games and VFX, but struggles for market dominance with *3ds max* and *Maya*	£4,485 ($6,995)	Softimage	www.softimage.com	55	For power users, *XSI 4 Advanced* also throws in *BatchServe* and eight satellite render licences for free. Still no decent NURBS or curve tools, though!	9
STRATA 3D CX	Mac/PC	Long-established, if relatively niche, mid-price 3D package now targeted at illustrators	£346* ($695)	Strata	www.strata.com	55	A capable, if idiosyncratic, package for a print graphic artist looking to team *Photoshop* and *Illustrator* with a little 3D. Far weaker for animation, however	7
TRUESPACE 6.6	PC	Another fixture in the increasingly crowded mid-price 3D software market, still widely used	£310* ($595)	Caligari	www.caligari.com	38	Improving animation and dynamics, version 6.6 addresses many of *trueSpace's* shortcomings, but the current interface now looks to have reached its limits	8



TALKING POINT | The cost of professional 3D software

FIVE YEARS AGO, most high-end 3D software packages cost over £2,500. Today, an industry-standard application can be bought for as little as £300. Great news for home users, but developers find themselves having to work increasingly hard to justify the cost of each upgrade. Alias – ironically, perhaps the company most responsible for the relative affordability of modern professional 3D software – has recently come under fire for the £659 ($899) price tag attached to its upgrade to *Maya 6.5 Complete*. The company points to *Maya 6.5*'s improved modelling and rendering tools, and a reported ten-fold increase in speed. But how much do power and speed matter to users these days? Or is the bottom line all that really counts?

Read our *Maya 6.5* review on page 90

TEXTURING

BODYPAINT 3D 2	Mac/PC	Powerful specialist 3D painting package, used on increasingly high-profile VFX projects	£425 ($745)	Maxon	www.maxon.net	47	Much quicker and simpler to use than the first release, and results can be stunning. Rock solid and well documented, but one for specialist texture artists	9
DEEP PAINT 3D 2	PC	Established 3D painting app, but not recently updated, and losing headlines to *BodyPaint*	£307* ($595)	Right Hemisphere	www.righthemisphere.com	26	Powerful, but RAM-hungry, and advanced mapping tools are presented in a separate app, *Deep UV*. Not recently updated, however, unlike *BodyPaint 3D*	8
PAINT SHOP PRO 9	PC	Inexpensive 2D painting and bitmap-editing app, unfairly regarded as 'just for hobbyists'	£99.95 ($129)	Corel	www.corel.com	57	Fantastic value for money, and version 9 adds a proper history palette. Does nearly anything that *Photoshop* can, but needs better Alpha channel support	9
PHOTOSHOP CS	Mac/PC	The *de facto* standard for texture painting and image manipulation amongst CG artists	£515 ($649)	Adobe	www.adobe.com	48	Still *de rigeur* for professional 3D work. Few must-have features for 3D users in the latest release, but integrated photo stitching and Match Colours are handy	8

MODELLING

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	VERDICT	[illegible]
AC3D	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N/A	[Not previously reviewed in *3D World*]	**N/A**
AMAPI DESIGNER 7	[illegible]	[illegible]	[illegible] ($479)	[illegible]	[illegible]	40	A powerful modelling package, particularly for organic objects, although users will either love or loathe the interface, and documentation could be improved	**9**
AMAPI 7.5 PRO	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	**9**
AMORPHIUM 3	[illegible]	Blob-based modelling package, very popular with hobbyists, but not recently updated	£75* ($149)	[illegible]	[illegible]	[illegible]	A unique organic modelling package: only basic Sub-D tools, a slow renderer and a rather clunky interface, but what it does do, it does extremely well	**8**
[illegible]	[illegible]	[illegible]	[illegible]	auto•des•sys	[illegible]	63	[illegible]	**8**
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	60	A relatively pricey addition to a crowded market sector, but one with a uniquely customisable modular design. Some early stability issues, but improving rapidly	**8**
[illegible]	PC	[illegible]	[illegible]	Robert McNeel & Associates	[illegible]	36	[illegible]	**8**
SILO 1.3	[illegible]	[illegible]	[illegible]	Nevercenter	[illegible]	55	Has evolved into a promising app, following early stability issues. Quirky UV mapping, but good crossover between Sub-D and poly tools, and customisable	**9**
ZBRUSH 2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	53	[illegible]	**9**

CHARACTER AND FACIAL ANIMATION

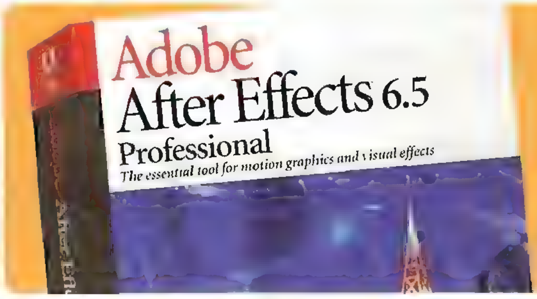
[illegible]	[illegible]	[illegible]	PRICE	DEVELOPER	WEBSITE	[illegible]	[illegible]	[illegible]
DAZ|STUDIO	Mac/PC	Long awaited new rival to *Poser*, currently still available as a free public beta	Free	DAZ Productions	[illegible]	N/A	[illegible]	**N/A**
[illegible]	[illegible]	Innovative 'motion-synthesis' system using A[illegible]	£7,995 ($12,975)	NaturalMotion	www.naturalmotion.com	56	Brilliant, technically accomplished, and fun to use, to boot [illegible]	**9**
FACESTATION 2	PC	Turn video footage of an actor's face into instant animation for *3ds max* and *Maya*	(£1,041* $1,995)	Digimation	www.digimation.com	[illegible]	[illegible]	**8**
LIFESTUDIO:HEAD 2.5 STANDARD EDITOR	PC	Customise a pre-built head model, apply instant lip synch and export as OBJs or an AVI	[illegible]	LifeMode Interactive	www.lifemi.com	44	Good texturing tools, but some tweaking is required to finesse the lip synch generated automatically from an audio track. Manual and UI need tidying up	**8**
LIFESTUDIO:HEAD 2.5 PRO ARTIST	PC	[illegible]	[illegible]	LifeMode Interactive	www.lifemi.com	44	[illegible]	**8**
MESSIAH:ANIMATE 5	PC	Powerful standalone animation package, also available as a plug-in for major 3D packages	£125* ($239)	pmG Worldwide	www.projectmessiah.com	29	[Reviewed at version 3] A comprehensive character animation solution with very fast IK and deformation and powerful expressions. Now reduced in price	**8**
[illegible]	[illegible]	[illegible]	[illegible]	pmG Worldwide	[illegible]	58	[illegible]	**7**
MOTIONBUILDER 6 STANDARD	Mac/PC	Innovative 'motion design' package, originally developed by Kaydara, now owned by Alias	£532* ($995)	Alias	www.alias.com	46	[Reviewed at version 5] Powerful FK/IK blending and real-time playback, plus a new Story Window to keep things organised. Quickly becoming indispensable	**9**
MOTIONBUILDER 6 PRO	Mac/PC	Pro motion editing app, an industry standard [illegible]	£2,244* ([illegible])	Alias	[illegible]	[illegible]	[illegible]	**8**
POSER 5	Mac/PC	The original figure-posing application, also used for pre-viz and simple animation work	£108* ($209)	Curious Labs	[illegible]	[illegible]	New hair and cloth, and a versatile new renderer, but many rough edges from [illegible]	**6**

RENDERING

PRODUCT	FORMAT	[illegible]	[illegible]	DEVELOPER	[illegible]	[illegible]	[illegible]	[illegible]
AIR	PC/Linux	*RenderMan*-compatible hybrid scanline/raytrace renderer used in film and stills work	£231* ($450)	SiTex Graphics	[illegible]	N/A	[illegible]	**N/A**
ART•LANTIS 4.5	Mac/PC	Old-school architectural rendering package, now awaiting an update to version 5.0	£349	Abvent	[illegible]	[illegible]	This interactive package is capable of high-quality results and provides decent renders quickly, without fuss. Few fine controls, though, and not recently updated	**7**
BRAZIL R/S	[illegible]	[illegible]	[illegible]	SplutterFish	[illegible]	[illegible]	[illegible]	**9**
FINALRENDER STAGE-1	[illegible]	[illegible]	[illegible]	Cebas	www.finalrender.com	[illegible]	Powerful new HyperGI engine and caustics tools, but exceptional results require a lot of tweaking. Some instabilities, particularly in distributed renders	**7**
MENTAL RAY 3	[illegible]	[illegible]	[illegible]	mental images	www.mentalimages.com	N/A	[Not previously reviewed in *3D World*]	**N/A**
[illegible]	[illegible]	[illegible]	Free	[illegible]	www.povray.org	N/A	[Not previously reviewed in *3D World*]	**N/A**
RENDERMAN 12	Mac/PC	Pixar's rendering workhorse for production pipelines, the standard for film effects work	£1,808* ($3,500)	Pixar	renderman.pixar.com	36	[illegible]	**N/A**
TURTLE	Mac/PC/Linux	Third-party *Maya* renderer, designed to offer a new balance of speed and image quality	£619* ($1,199)	Illuminate Labs	[illegible]	55	Blisteringly fast raytrace rendering. Currently best suited to architectural work, due to lack of support for particles and Paint Effects, but developing rapidly	**7**
V-RAY	[illegible]	[illegible]	[illegible]	Chaos Group	www.vrayrender.com	N/A	[Not previously reviewed in *3D World*]	**N/A**

COMPOSITING AND EFFECTS

AFTER EFFECTS 6 STANDARD	Mac/PC	One of the most popular desktop compositing packages, usable even for broadcast work	£565 ($699)	Adobe	www.adobe.com	47	[illegible]	8
AFTER EFFECTS 6 PROFESSIONAL	Mac/PC	As *After Effects Standard*, plus some high-end tools: worth investing in for professional work	£915 ($999)	Adobe	www.adobe.com	47	Motion tracking, enhanced keying and masking, particle systems and 16-bit colour tools make this a better option than *AE Standard* for serious 3D work	8
COMBUSTION 3	Mac/PC	Discreet's own desktop compositor, unsurprisingly often teamed with *3ds max*	£877.25 ($995)	Discreet	www.discreet.com	47	Better particle tools and connectivity with 3D software than *After Effects*, plus a strong colour keyer, but limited text tools and a relatively steep learning curve	9
DFX+ 4	PC	Cut-down modular version of *Digital Fusion*, much beloved of PC-based *Lightwave* artists	Priced by module	eyeon Software	www.eyeonline.com	44	Most of the improvements in version 4 are cosmetic, but still a powerful, affordable node-based compositing app. Good visual effects and 3D tools	8
DIGITAL FUSION 4	PC	One of the first PC-based desktop compositing packages, but still relatively little known	£2,579* ($4,995)	eyeon Software	www.eyeonline.com	43	[illegible]	8
MOTION	Mac	Entry-level motion-graphics package, suitable for simple compositing, titling and effects	£199 ($299)	Apple	www.apple.com	61	Good masking and particle tools: not simply a cut-down version of *After Effects*. No tracking or true 3D layers, though, and the interface can be sluggish	8
SHAKE 3.5	Mac/Linux	[illegible] effects	[illegible]	Apple	[illegible]	54	[illegible]	8



TALKING POINT | Why use a compositing package?

DESKTOP COMPOSITORS aren't simply for moving footage. In his Q&A on lighting a realistic interior scene this issue, Gary Noden discusses how to use *After Effects* to combine the render passes of a still image. It's a useful technique, but does the additional control over the look of the finished image offered by this way of working justify the expense of buying an additional software package? Read the Q&A and judge for yourself.

Gary Noden's *Maya* Q&A starts on page 72

CAMERA TRACKING AND MATCH MOVING

3D-EQUALIZER 3	Mac/Linux	[illegible]	On request	Science-D-Visions	[illegible]	N/A	[Not previously reviewed in *3D World*]	N/A
BOUJOU 3	Mac/PC/Linux	One of the first major alternatives to *3D-Equalizer*, popular in the effects world	£5,141* ($10,000)	2d3	www.2d3.com	30	[Evaluated at version 2] Generates excellent results and a relatively shallow learning curve. The new Cold Tracks feature significantly raises user control	N/A
BOUJOU BULLET	Mac/PC/Linux	Cut-down, wizard-driven version of *boujou*, intended for small to medium-sized facilities	£1,300* ($2,500)	2d3	www.2d3.com	N/A	[Not previously reviewed in *3D World*]	N/A
MATCHMOVER PRO 3.1	Mac/PC/Linux	Another of the old guard of desktop tracking applications, recently reduced greatly in price	£2,062* ($3,500)	Realviz	www.realviz.com	63	A highly evolved version of the software, with powerful 2D and 3D tracking tools. No optical flow facility, however, and the mo-cap module costs a lot extra	7
PFMATCH	Mac/PC	*PFTrack*'s younger sibling, offering a useful range of tracking tools at an entry-level price	£600 ($1,160)	The Pixel Farm	www.thepixelfarm.co.uk	57	Great price, although only broadcast-resolution footage in AVI and QT formats is supported. Good user control in version 1.5, but no proxy [illegible]	8
PFTRACK 2	Mac/PC	First of a new generation of lower-priced broadcast-quality camera tracking packages	£3,000 ($5,801*)	The Pixel Farm	www.thepixelfarm.co.uk	57	Fast and robust 2D and 3D tracking, with powerful optical flow and analysis tools. Affordable, although recently undercut in price by *MatchMover Pro*	9
SYNTHEYES	PC	Astonishingly affordable new all-round [illegible]	£180* ($349)	Andersson Technologies LLC	www.ssontech.com	49	An incredible range of tools for the price outperforms costlier rivals on many [illegible]	9

LANDSCAPE GENERATION

BRYCE 5	Mac/PC	[illegible]	£4[illegible]* ($[illegible])	DAZ Productions	[illegible]	6	[illegible]	8
MOJOWORLD 3	Mac/PC	Unusual landscape-generation app with a unique emphasis on creating entire planets	£103* ($199)	Pandromeda	www.pandromeda.com	60	A unique approach to landscape generation that will divide users. Some great tools, but hard to control fine details and the interface can be frustrating	6
VUE 4 PROFESSIONAL	Mac/PC	First edition of *Vue* specifically aimed at professional effects work: soon to be updated	£[illegible]* ($[illegible])	e-on Software	www.e-onsoftware.com	46	[illegible]	8
VUE 5 ESPRIT	Mac/PC	Landscape generation's current market leader. High-quality results at an affordable price	£129* ($249)	e-on Software	www.e-onsoftware.com	59	Rightly the best-selling landscape generator. Very realistic results, and easy to master. New GI rendering is slow, however, and still no proper animated water	9
WORLD CONSTRUCTION SET 6	Mac/PC	[illegible] powerful package [illegible]	£[illegible]* ($500)	3D Nature	[illegible]	13	[illegible]	8
WORLDBUILDER GENESIS	PC	[illegible] alternative to the *Vue* family: more powerful [illegible] technical than WCS	£92* ($179)	Digital Element	[illegible]	57	Beautiful end results and fairly easy to use. Not very [illegible] *3ds max* though, while some of the new features [illegible]	7
WORLDBUILDER PRO 4	PC	[illegible]	£[illegible]* ($[illegible])	Digital Element	[illegible]	57	[illegible]	7

WEB 3D AND MULTIMEDIA

ANARK STUDIO 2	Mac/PC	Established authoring package for interactive 3D presentations	£510* ($995)	Anark	www.anark.com	N/A	[Not previously reviewed in *3D World*]	**N/A**
AXELEDGE 2	Mac/PC	All-in-one authoring and online animation package, described as 'like *Flash* in 3D'	£309* ($595)	MindAvenue	www.mindavenue.com	33	Powerful all-round authoring package with good animation and interaction editing tools. Import and export options much improved since version 2.0	**8**
CULT3D	Varies	Free software suite for exporting *3ds max* and *Maya* models in interactive online format	Free	Cycore	www.cycore.com	12	[Reviewed using the *3ds max* exporter] Relatively straightforward to use, with a good range of options in the exporter. Very much more stable in recent builds	**7**
DIRECTOR MX 2004	Mac/PC	*De facto* standard for authoring multimedia CD/DVDs, now incorporating simple 3D tools	£809 ($1,099)	Macromedia	[illegible]	37	Greatly improved layout, but few new 3D tools since version 8.5. Havok physics and useful Web output tools, but programming needed for complex effects	**7**
QUEST3D 2.1 ENTERPRISE	PC	Real-time 3D authoring tool, also available in cheaper *Lite* and *Professional* editions	£1,035* ($1,999)	Act-3D	www.quest3d.com	48	Full-featured all-round authoring app, but fairly easy to master: no programming required. Can become unmanageably cluttered on complex projects, though	**8**
SWIFT 3D 4	Mac/PC	3D to vector graphics conversion tool, one of the most regularly updated interactive 3D apps	£97* ($189)	Electric Rain	www.swift3d.com	56	No major new tools, but several key usability tweaks see this 3D-to-*Flash* app maturing as a package. Generates simple animations quickly and painlessly	**9**
WIREFUSION 4 ENTERPRISE	[illegible] Linux	[illegible] 3D content, also available in cheaper editions	[illegible] ($1,995)	Demicron	[illegible]	56	Straightforward all-round authoring solution: no need for programming or specialist plug-ins to view output. Slightly unorthodox, but quick to master	**8**

OTHER TOOLS

3D S.O.M	PC	Image-based modelling software: one of the newer, less expensive additions to the market	£299 ($582*)	Creative Dimension Software	www.3dsom.com	43	Requires photos of an object against a marker grid like [illegible] Modeler, but offers greater automation and can use uncalibrated images for texturing	**8**
D JOINER	PC	Photo-stitching software: less widely known than *Stitcher*, but suitable for many projects	£300 ($575*)	D Vision Works	www.d-vw.com	20	In good hands, it does what it's meant to do. But it suffers from a lack of auto-features and poor usability. Documentation is disappointingly slim, to boot	**7**
D SCULPTOR 2 STANDARD	PC	Image-based modelling software: another mid-priced package, aimed at home users	£500 ($960*)	D Vision Works	www.d-vw.com	11	[Reviewed at version 1] A good tool for creating 3D models from images, and cheaper than *ImageModeler*. Much slower and not as powerful, however	**8**
DEEP EXPLORATION 3.0	PC	File-conversion software: capable of tackling a wide range of file formats, including CAD	£77* ($149)	Right Hemisphere	www.righthemisphere.com	45	Well-designed model viewer, file conversion and asset management utility. Includes basic 3D model editing tools, rendering and Shockwave output	**8**
FRAMEFORGE 3D STUDIO	Mac/PC	Storyboarding software: first of a new wave of apps aimed at previz and 3D storyboarding	£180* ($349)	Innoventive Software	www.frameforge3d.com	55	Extremely easy to use, and scales to even high-budget movies. Spe[illegible] props only available as add-on packs, though [illegible]	**9**
IMAGEMODELER 4	Mac/PC	Image-based modelling software: one of the earliest desktop photogrammetry packages	£712* ($1,380)	Realviz	www.realviz.com	59	Gives professional-quality results, and can cope with architectural-sized objects, but requires considerable user input. Quality also comes at a price	**7**
IMODELLER 3D 2.5 WEB	Mac/PC	Image-based modeling software: creates 3D models for online use, in a Java-based format	£70* ($134*)	UZR	www.imodeller.com	58	Like the pro version but cheaper. With the right objects, this can produce quite impressive results. Wait until the release of version 3, which supports concavity	**6**
IMODELLER 3D 2.5 PRO	Mac/PC	Image-based modeling software: all-purpose app, exporting to a range of 3D file formats	£352* ($675*)	UZR	www.imodeller.com	58	Impressive and more powerful than its main rival, *D Sculptor*, it has too many limitations. It may be easy to learn, but it's quirky and frustratingly unstable	**6**
NUGRAF	PC	File-conversion software: powerful, with support for batch conversion and CAD data	£256* ($495)	Okino	www.okino.com	21	[Reviewed at version 4] This affordable package performs a demanding task exceptionally well and is relatively affordable. User interface is a tad dated	**8**
PARTICLEILLUSION 3	Mac/PC	Particle software: generates 3D-style effects in 2D. Niche, but used on many pro projects	£206* ($399)	Wondertouch	www.wondertouch.com	41	A fast, flexible alternative to conventional 3D particle effects, and fits well into production pipelines. Would be improved by more specific forces and user control	**8**
POLYTRANS 4	PC	[illegible]	£204* ($395)	Okino	www.okino.com	2	[Reviewed at version 1] Not your everyday 3D program, but a very useful one that all 3D artists should consider. Conversion doesn't always run smoothly	**7**
REALFLOW 3	Mac/PC/ Linux	Fluid-simulation software: the current market leader for realistic fluids, used in film projects	£620* ($1,200)	Next Limit	www.nextlimit.com	60	Sets the benchmark for power and controllability for fluid-simulation systems, but at a price. Still some stability and UI issues, particularly in the Mac version	**7**
STITCHER 4.0	Mac/PC	Photo-stitching: the leader in its field, though similar tools are now present in *Photoshop*	£299* ($580*)	Realviz	www.realviz.com	50	Incredibly powerful and versatile. Not a quick solution, but stands above the competition in quality of results, although that quality comes at a price	**7**
STORYVIZ	PC	Previsualisation software: the latest in a new wave of previz and storyboarding apps	£1,858* ($3,600)	Realviz	www.realviz.com	60	Far more flexible and open-ended than simple storyboarding apps, and includes a timeline and keyframe animation capabilities. A serious investment, however	**8**

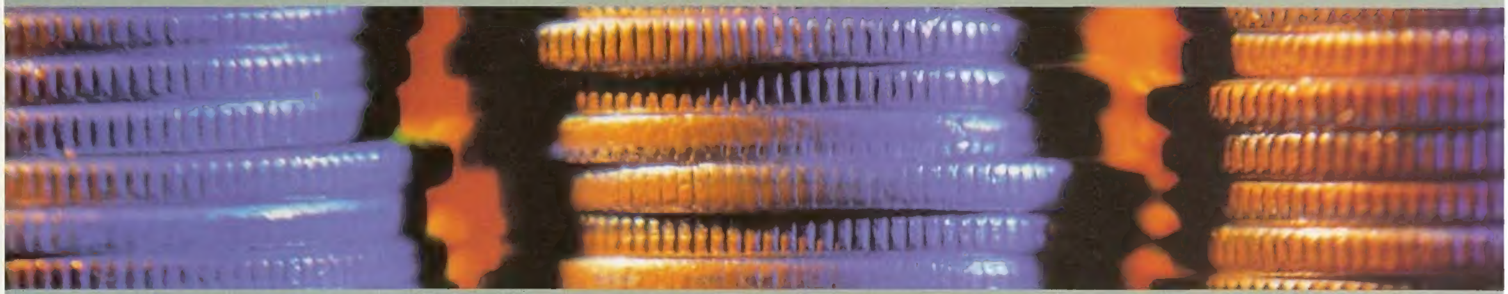
CONTACT US | Have we missed anything?

THINGS CAN CHANGE very quickly in the world of 3D software. If you've spotted an error in this buyer's guide, please contact us at the email address below. However, before writing in, please bear the following points in mind:

1. All prices exclude VAT and shipping, plus any optional extra costs, such as printed manuals or maintenance contracts.
2. Asterisks denote currency conversions from a list price at the current rate of exchange when the entry was added to the buyer's guide.
3. Due to limitations of space, not all sectors of the 3D market can be covered each issue. We aim to vary our listings from month to month.
4. Space also precludes us from listing the thousands of plug-ins currently available.
5. The verdict column contains a synopsis of our last published review. In most cases this will refer to the current version of the software. Where this is not so, it should be clearly noted.

To notify us of an error in this buyer's guide, contact us at: 3dworld@futurenet.co.uk

BUSINESS END



Each issue, our panel of experts answers the legal and financial questions of freelancers and small studios. This month, we ask...

"How do I market myself?"

Q Two colleagues and I are leaving our current well-known company to set up our own studio. When should we start telling people in the industry, and what's the best way to get our message out? How much money should we spend on PR, and how can we maintain our profile in the future, after our first flurry of work has come in? **NAME WITHHELD, MANCHESTER**

A When any staff leave a company, it goes one of two ways: either there are big hugs and kisses, and they give you some projects to be going on with; or they believe that you're going to be a potential threat, and won't be giving out your new phone number. It's likely to be the latter, and this will be the first hurdle you have to overcome - but you can do it. The first and major benefit is that you're now newsworthy material for magazine editors, and can therefore get some PR coverage.

In terms of when to tell people, it's best to do this once you've left your previous company. However, if you've already started out on your own and you haven't told anyone yet, you can always make up a launch date. It might be worth paying a professional PR person to help you with the first six weeks, and with writing your first press release. A PR person will ensure that the information is presentable and correct, and that journalists have contact details if they want more information; he or she should also have the right contacts to send the press release to. You don't need to spend a fortune here, no more than £1,000 - money well spent if it ensures you get your message out.

So what do you tell people? The main things to get across are your core business (is it commercials, film, broadcast, games or effects?) and who you are (what company you've come from, and what projects you've worked on). A photo of the three of you, or an image of a project you've worked on, would also increase the likelihood and amount of coverage. If you want to do this yourself, then always blind CC the press list, copy your release into the email and don't send any huge image attachments. Remember to stay positive about your previous company - this is a very small industry, and they might have some overflow work for you one day.

Next, think about your website. If you're a visual effects company, you'll probably want to create something that resembles an ILM production, but all people need to know at the beginning is how to find you, what effects you're offering and what number to call you on. Often people will read an article about a company, put the name into Google and voila! A lot depends on the name of your company - if it's a well-known term, it will be worth investing £500 on a search-engine optimisation, and investing in some digital marketing by getting advice on using keywords on your site. Now you can target producers you know and have worked with before. If you have a database of potential clients then a cheap way to promote yourself is through postcard mailers - design a campaign around an image that not only demonstrates the work you do, but is also something that people will want to stick up around their desks - and will therefore remember you by.

Do you have a showreel? So many effects houses don't have one, or they have one that's out of date. Instead of spending vast amounts of money on packaging, create a compressed version that you can email, or make available for download from your website. The key here is to actually have one, rather than spend months agreeing the design and content, and to keep it updated.

When you've done your first job, tell the press. You must get approval from your client, and they in turn might need permission from their end client. With films in particular, this can be a difficult process; some of the larger production companies won't allow any publicity around the making of a film. Using a PR professional can make this process easier, and they'll know how to pitch the story to editors. Images will be key here and, once everything's approved, it'll be great for your website and, of course, for your showreel.

WHERE NEXT?

So far I haven't mentioned advertising. I would suggest looking into this later on, when your company is slightly more established. Use advertising to reinforce your brand, or to help you break into new markets. Directories can be a good way of getting the company included in listings, and online versions such as Animation World Network are cheap and easy to use.

In terms of how much to spend on all this, it's like a piece of string - although, generally, if you constantly spend money with a PR agency you're more likely to get consistent coverage. Choose an agency that knows the business, the technology and the journalists - in fact, asking editors of magazines that you regularly read is a great place to start, as they'll recommend agencies that they have good relationships with. Also, ask the agency for examples of coverage it has gained for similar clients. You can of course do your PR yourself, and you'll need to set aside time for this. Finally, bear in mind that journalists, ex-clients and potential clients are not psychic. You need to shout about who you are and what you're doing - do this consistently and they'll hear you.

Sadie Paris is the Managing Director of Bubble & Squeak, a PR agency specialising in broadcast, post-production and visual effects with offices in Soho, Los Angeles and Boston.
[w] www.bubblesqueak.co.uk

● OTHER RESOURCES

UK Flyers:
Printing specialist - find out about having flyers or posters printed to promote your company
www.ukflyers.com

Animation World Network:
An online directory of companies
www.awn.com

Mandy.com:
International directory of film and TV producers
www.mandy.com

Public Relations Consultants Association:
Head here for tips on using PR agencies or doing your own PR
www.prca.org.uk

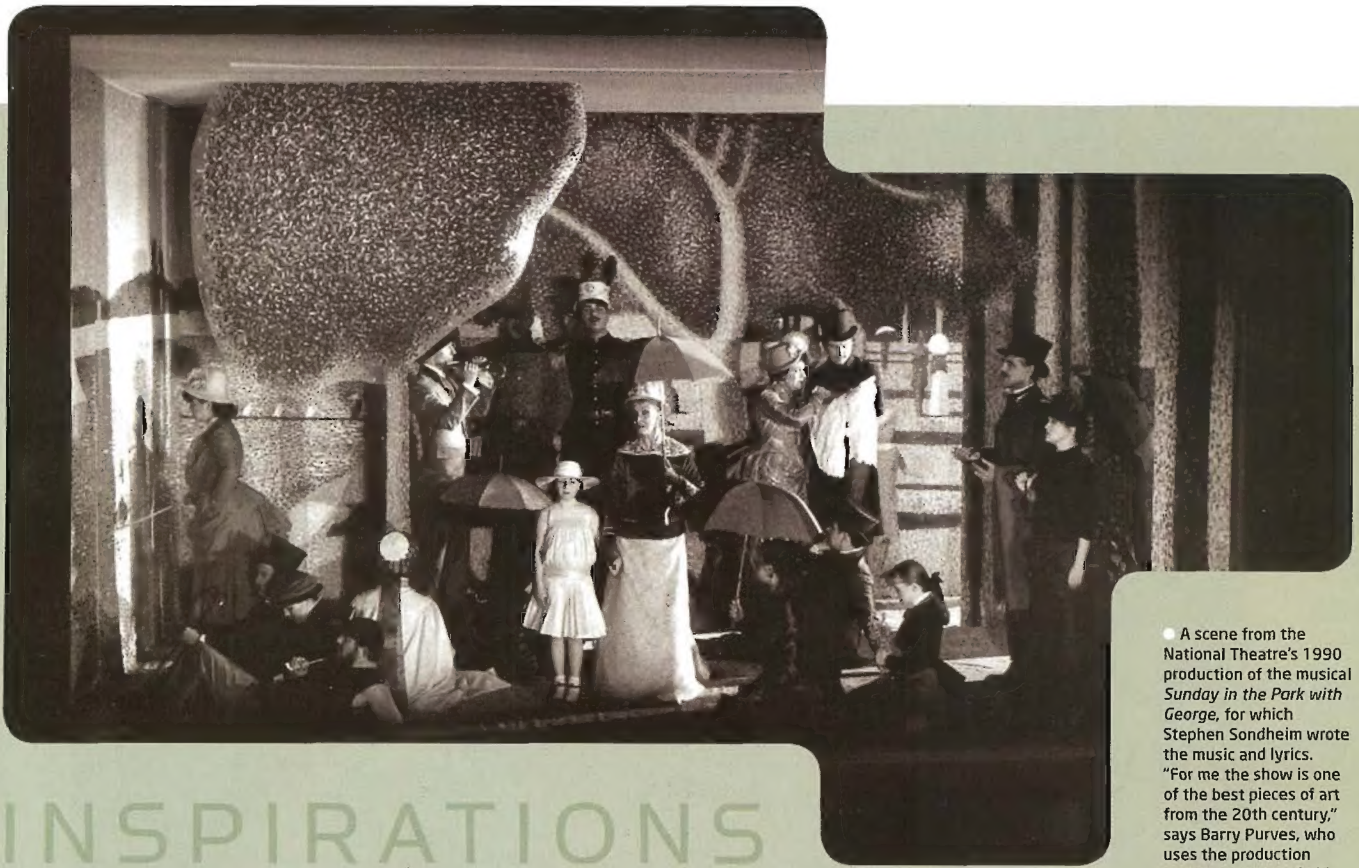


IMAGE © Richard Mildenhall

A scene from the National Theatre's 1990 production of the musical *Sunday in the Park with George*, for which Stephen Sondheim wrote the music and lyrics. "For me the show is one of the best pieces of art from the 20th century," says Barry Purves, who uses the production as a teaching tool in his 'acting for animation' workshops. "It's about art, and about looking at art, but also about the way people relate to one another."

INSPIRATIONS

Leading figures from the world of 3D discuss the sources of their inspiration. This issue: **Barry Purves** on Stephen Sondheim musicals

"PEOPLE SOMETIMES ASK me which animators have inspired me, and I have to say 'Bloody hell, I can't answer that one'. But musicals have always been in my life. I would have been about ten when I saw my first Sondheim show - it would probably have been *Gypsy* in the early '60s - and I remember watching it and thinking that it was a good brash story about showbiz, but there was so much else going on. Since then, I've tried to see every professional Sondheim production done in England, and most of the major ones on Broadway.

For me, the key show is *Sunday in the Park With George*, which is based on the Seurat painting *A Sunday Afternoon on the Island of La Grande Jatte*. For me, the show is one of the best pieces of art from the 20th century, which sounds incredibly pretentious, but it's true. The first time I saw it something clicked in me; it's about art, and about looking at art, but also about the way people relate to one another. I've watched the final scene in act one, in which all the characters move into the positions from the painting, scores of times, and each time I'm weeping, grown men around me are weeping, and they don't know why. Words, music, design, characters - all the elements of storytelling - meld in that show perfectly. At a film festival in Chicago three years ago a great treat was being able to see the painting in the afternoon and the show in the evening. It was an overpowering experience.

I use *Sunday in the Park* as a teaching tool, and while animators aren't usually familiar with it in advance, when I screen it jaws just drop. Musicals are like animation: they're fake, and they revel in that fakery, but through their fakery there's a great distillation of a truth. Musicals celebrate the very artificial use of words and music; with animation, it's usually movement.

The other thing about Sondheim is that he came out of a background of shows like *Hello Dolly* that were generally rather naff and camp. Musicals were meant to be light and frothy, apparently, and he turned that idea on its head, giving us very substantial, intelligent, adult pieces. In the same way, it's easy to believe that animation is meant to be gag-led, that it's only about talking animals, or buddy movies, and that's an idea that needs to be turned on its head, too. I think what I'm saying is that I'd like animation to press a wider range of emotional buttons, in the way Sondheim made shows that pressed emotional, sexual, and intellectual buttons. *Les Misérables*, though not by Sondheim, may be three hours long, there may only be two jokes, and at the end everyone dies, but it's still the most popular musical in the world. I'd love to do an animated feature from which people came out crying and happy."

Barry Purves is an Oscar-nominated stop-frame animator and has led 'acting for animation workshops' at 3D studios around the world, recently working at Weta
[w] www.barrypurves.com

Sunday in the Park with George
DVD

ABOUT STEPHEN SONDHEIM

Stephen Sondheim was born in New York in 1930, and mentored by the lyricist Oscar Hammerstein II and the composer Milton Babbitt. The lyricist for both *West Side Story* and *Gypsy*, he has written and composed some of Broadway's most acclaimed musicals, including *Company*, *A Little Night Music* and *Into the Woods*. In 1985 he won the Pulitzer Prize for Drama for *Sunday in the Park with George*. A DVD of the musical is available via Image Entertainment.

CD CONTENTS #64

RealFlow 3

DEMO Recreate our cover with this almost unrestricted evaluation copy of the leading fluid-simulation software

A NON-TIME-LIMITED evaluation version of Next Limit's powerful *RealFlow 3* fluid-simulation software. The product combines a powerful set of features for physical simulation, including fluids, rigid bodies, soft bodies, constraints, wave generation and buoyancy. Unlike previous evaluation versions, the software is not save-disabled, enabling you to export projects to your favourite 3D software package, although it does lack the command-line interface of the commercial version.

Master *RealFlow 3*'s extensive feature set by following Darren D'Agostino's tutorial on recreating our cover image and accompanying animation, which can be found on page 42. Full supporting files are supplied on the CD.

FACTFILE

FORMAT
PC / Mac / Linux

MINIMUM SYSTEM
Windows 2000 Pro / OS X 10.3.5 / Red Hat Linux 8.0, Pentium II / Athlon / 1GHz G4, 512MB RAM, three-button mouse

DEVELOPER
Next Limit

WEBSITE
www.nextlimit.com

USING THE CD

GETTING STARTED
On a PC, this CD should autorun when inserted into your CD drive. If not, run 3dw.exe. To toggle autorun on and off, use the Control Panel on your computer. On a Mac, choose 3DWiClassic or 3DWiOSX to suit your operating system.

USING THE INTERFACE
The disc interface requires Windows 98, Me, 2000, XP or Mac OS 8+. You'll also need an active internet connection to make full use of the interface. For best results, ensure you're using a version 3 Web browser or better.

POINTS TO NOTE

- Some software may require free registration over the internet or by phone
- Some software may not be available in all territories
- Values quoted are the original prices for which the software was sold (including packaging and manuals).

XSI 4.2 Mod Tool

PC ONLY Follow our beginners' tutorial using this educational version of XSI

MASTER THE ESSENTIALS of 3D animation with our new series of introductory tutorials, the first of which starts on page 50. The walkthrough uses *Softimage|XSI*, but if you don't own the commercial version of the software, you can follow by installing this educational edition of the product, aimed at the games modding community. Limitations of this edition include: saves only in the proprietary EXP file format; all renders are watermarked and restricted to 512 x 512 pixels in size; and some advanced tools are disabled. For a full list of system requirements and restrictions, see the disc interface or the Softimage site.

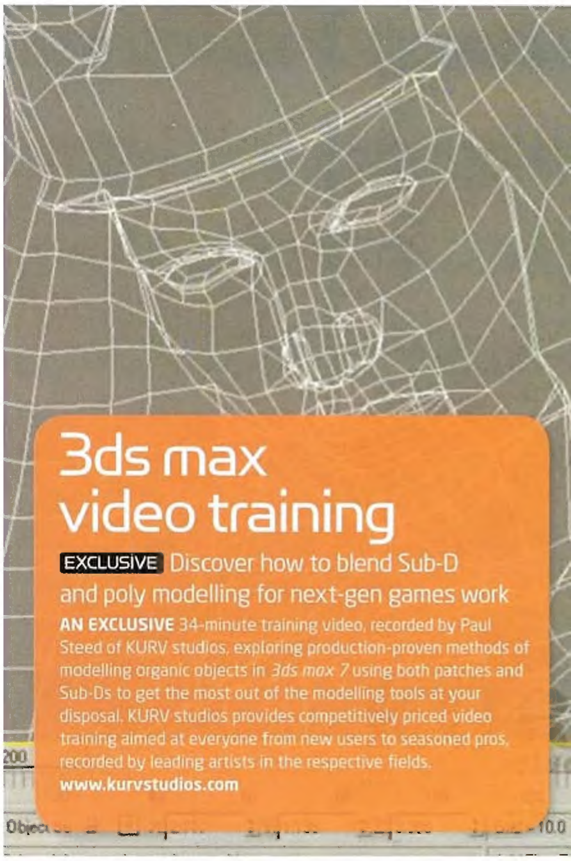
FACTFILE

FORMAT
PC

MINIMUM SYSTEM
Windows 2000 SP2, Pentium III / AMD K7, 256MB RAM, 1280 x 1024 display, three-button mouse

DEVELOPER
Softimage

WEBSITE
www.softimage.com



3ds max video training

EXCLUSIVE Discover how to blend Sub-D and poly modelling for next-gen games work

AN EXCLUSIVE 34-minute training video, recorded by Paul Steed of KURV studios, exploring production-proven methods of modelling organic objects in *3ds max 7* using both patches and Sub-Ds to get the most out of the modelling tools at your disposal. KURV studios provides competitively priced video training aimed at everyone from new users to seasoned pros, recorded by leading artists in the respective fields.
www.kurvstudios.com

FULL CD CONTENTS | What's on the 3D World disc this issue

LEAD CONTENTS

REALFLOW3 (EVALUATION COPY)
SOFTIMAGE|XSI 4.2 MOD TOOL
VIDEO TRAINING
For full details, see facing page

BONUS MATERIAL

FRAMESTORE CFC ANIMATICS

A collection of exclusive 'making of' material relating to Framestore CFC's new 'Esuvee' TV ad, kindly supplied by the studio for the *3D World* CD. You can read the hair-raising story of its creation in our Close Up article this issue, while the ad itself can be viewed online on the Framestore CFC website
www.framestore-cfc.com
Close Up: page 24

OTHER RESOURCES

100 LWO-FORMAT MODELS

A versatile collection of 3D models, supplied by online vendor The Epic Software Group in LWO format. This selection includes characters, animals, vehicles, science-fiction and urban models. The full Epic 3D Model Library contains over 500 models, available on two CDs, while over 1,400 Epic models are available via the Turbo Squid online marketplace
www.epicsoftware.com

18 TEXTURES

A comprehensive selection of high-resolution, fully tiling photographic textures of ground surfaces supplied for use in your projects by Amazing Textures. These textures are licensed for commercial use
www.amazingtextures.com

3D
WORLD
CD64
LEAD CONTENTS
• REALFLOW3 (DEMO)
• XSI 4.2 MOD TOOL
• 100 MODELS (LWO)
future publishing
COMPACT disc
TDW64/05/05 © Future Publishing

JENNA 2.22 (FULL)

A full copy of the popular plug-in suite for *Cinema 4D R9*, worth $200, plus bonus material. For full details, see the disc interface
www.corearsenal.com

SUPPORTING FILES

Full-sized screenshots, project files and other resources to accompany the tutorials and Q&As printed in the magazine this issue
Magazine contents: page 4

TROUBLESHOOTING

THIS IS A FUTURE TECHNOLOGY CD-ROM. This disc has been thoroughly scanned and tested at all stages of production, but – as with all new software – we still recommend you run a virus checker before use and have an up-to-date backup of your hard drive. While every effort has been made to keep this CD virus-free, Future Publishing Ltd cannot accept responsibility for any disruption, damage and/or loss to your data or computer system that may occur while using this CD or the programs and data on it. Consult your network administrator before installing software on a networked PC.

If you are having difficulties using the interface or content, please visit Future Publishing's reader support website at **www.futurenet.co.uk/support**. On this regularly updated site, you'll find solutions to many commonly reported problems. If you still experience difficulties, please email our reader support team (**support@futurenet.co.uk**) or call **+44 (0) 1225 442244** and ask for coverdisc support. Please note that we can only provide technical support for the installation of software. Unfortunately, we cannot give in-depth help on the applications included on this CD, or on your hardware or operating system. For software support-related issues, please contact the relevant product's developers. We also regret that we are unable to provide serial numbers over the phone. Future Publishing can only provide technical support for this cover disc for a period of six months after this magazine's on-sale date.